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## SEPTEMBER 2021

### G.S PAPER II

#### 1. POLITY

##### **Madras HC Order on Fake Journalists**

##### **Why in news?**

The Madras High Court has ordered the Tamil Nadu government to constitute a 'Press Council of Tamil Nadu' within 3 months to weed out fake journalists.

##### **What was the case on?**

- The original case was initiated by a man (claiming to be a journalist) making allegations against a special team investigating temple idols theft.
- It was disposed of with a direction to the Idol Wing CID to proceed with the investigation in accordance with the law.
- But, given the suspicion over the petitioner's credentials of being a journalist, the Bench has proceeded to address the larger problem of fake journalists.

##### **What are the issues identified with fake journalists?**

- Nexus with politicians, smugglers and even murderers.
- Run letter-pad publications, or even print some copies of obscure journals, and work for vested interests, but seek benefits of journalists.
- Fraudsters masquerading as journalists using posh cars with a "PRESS" sticker on the front windshield and "Human Rights" label in the rear.

##### **What are the Court's specifications for the Council?**

##### **Composition**

- Headed by a retired judge of the Supreme Court or High Court.
- Members - Team of experienced and reputed journalists (both working and retired), retired civil servants and police officials in the rank of IAS and IPS

##### **Powers and Functions**

- Regulate the distribution of identity and accreditation cards and the recognition of media bodies.
- Power to identify fake journalists and lodge complaints against them to jurisdictional police.
- Sole authority to recognise press clubs and journalists' associations or unions in the state.
  - i. Shall not allow or recognise formation or continuation of clubs, unions/associations based on caste, community or state boundaries.
  - ii. Conduct and approve elections to these associations.
  - iii. Management should be vested with the elected team of office bearers only after such approval by the board.
- The State Government can allot any house or grant free bus passes to any applicant journalists only through the Council, which after due diligence can issue such benefits.
- Prohibit conduct of State conferences by journalists' associations without permission/approval of the Council.
  - Get details on the source of income and other relevant details before giving permission to such meetings.
- The government/council shall not issue press ID cards or stickers to the print media / magazines / dailies unless there is proof of circulation of at least 10,000 copies of their daily, weekly, fortnightly, or monthly.

- ID cards shall be increased or decreased proportionate to their circulation.
- Receive and dispose of complaints about the media/fake journalists
  - Members of the public can send their complaints to the welfare board, which shall inquire and initiate criminal action.

### **Why is the Court's order significant?**

- Creating a body and conferring it with powers and functions is generally done by law and after wider consultations.
- So, the HC's order is a sign that the judiciary has come close to formulating policy and legislation.

### **What role does the Press Council of India have?**

*Newspapers, books and printing presses are in the Concurrent List.*

- As of now, the PCI performs the watchdog role about public complaints.
- But it lacks any substantive enforcement powers.
- Accreditation and dealing with journalist bodies are now the functions of the respective state governments.
- A powerful body to identify and accredit journalists, decide their entitlements and welfare measures, and to act as a complaints authority will need a statutory framework.

## **Spirit of Federalism**

### **What is the issue?**

Recently, various State governments raised concerns about Central unilateralism in the enactment of laws on subjects in the Concurrent List.

### **What are the recent contentions?**

- Parliament passed the farm laws without consulting the States.
- They were passed by Parliament even as it does not have legislative competence to deal with agriculture.
- The laws are related to Entry 14 (agriculture clause) belonging to the State List.
- But were passed by Parliament citing Entry 33 (trade and commerce clause) in the Concurrent List.
- Field for legislation of non-major ports is in Entry 31 of the Concurrent List.
- According to the Indian Ports Act, 1908, which presently governs the non-major ports, the power to regulate and control the minor ports remained with the State governments.
- However, the new draft Indian Ports Bill, 2021, proposes to transfer the powers to the Maritime State Development Council, which is controlled by the Union.
- Electricity is traceable to Entry 38 of the Concurrent List.
- The power to regulate the sector was vested with the State Electricity Regulatory Commissions.
- However, the proposed amendment seeks to establish a National Selection Committee, taking away the states' power to regulate the electricity sector.

### **What has been the reaction?**

- The lack of consultation in a matter that deals with millions of farmers also led to massive protests.
- Kerala Assembly unanimously passed a resolution against the Electricity (Amendment) Bill, 2020.
- TN Assembly passed a resolution against the farm laws.
- Major Ports Authorities Act, 2021 passed by Parliament was opposed by Goa (ruled by the same party), stating that it would lead to the redundancy of the local laws.
- The Union government's increasing take-over of the Concurrent affects the balance of the Constitution.

### What should be done?

- **Sarkaria Commission Report** - There should be a –coordination of policy and action in all areas of concurrent or overlapping jurisdiction through a process of mutual consultation and cooperation is, therefore, a prerequisite of smooth and harmonious working of the dual system□.
- Union government, while exercising powers under the Concurrent List, limit itself to the purpose of ensuring uniformity in basic issues of national policy and not more.
- **Venkatachaliah Commission** - Individual and collective consultation with the States should be undertaken through the Inter-State Council established under Article 263 of the Constitution.
- **S.R. Bommaivs Union of India** - States are not mere appendages of the Union.
- The essence of cooperative federalism lies in consultation and dialogue.

### Refining the Reservation Policy

#### What is the issue?

Recently there has been series of changes to the way reservation is implemented.

#### What changes were made recently?

- Tamil Nadu Assembly has adopted a Bill to provide 10.5% reservation for Vanniyars within the quota of MBCs and Denotified Communities (DNCs) in admission to higher education and government services.
- Relying on the 102<sup>nd</sup> Constitution Amendment, Supreme Court reiterated that States did not have the power to identify –socially and educationally backward□ classes (SEBCs)
- This forced the Centre to pass the 105<sup>th</sup> Amendment which again empowers States or Union Territories to prepare their own lists of SEBCs
- The Central Educational Institutions (Reservation in Admission) Act, 2006 provided for uniform 27% reservation to OBCs which was implemented in all the Central Educational Institutions
- However, this was not extended to the AIQ seats of State medical and dental colleges
- From this year onwards, 27% of all-India quota for admissions for medical and dental courses will be reserved for OBCs and 10% for EWS

#### What are the implications of the recent changes?

- Recent developments have led to the demand for a caste-based census and removal of the 50% cap on reservation
- **Caste Census** - The 2011 Socio-Economic and Caste Census's report was made public five years ago but without the data on caste
- Karnataka launched a similar exercise in 2015 but the report is not out
- Caste data alone cannot be used as the basis for breaching the 50% cap on reservation because there is no provision in the Constitution to link the quantum of reservation to the population
- **50% cap on reservation** – Tamil Nadu provides 69% quota for BCs, MBCs, SCs and STs but it was not framed keeping in mind the population of the reserved communities
- Several other States have breached the cap by adopting 10% quota for EWS.

#### How can the reservation policy be refined?

- Sub-categorisation is essential for equitable distribution of reservation benefits among OBCs
- **Rohini Commission** on sub categorisation of OBCs reports that just 10% of the OBC communities have accrued 24.95% of jobs and admissions
- Frequently revising the income limit in determining the creamy layer

- Inclusion of factors such as the trend of rise in GDP, inflation, per capita income and rise in the cost of living, etc. while revising the income limit
- The definition of income needs to change which exempts income from salary and agriculture but takes into account income from other sources
- The parliamentary committee had said that as on 2016, OBC employees in 78 ministries and departments of the Central government constituted only 21.57% against the quota of 27%
- Political parties should channel their energies to make substantive and qualitative changes in the way the reservation is implemented
- Need to develop an evidence-based policy options that can be tailored to meet specific requirements of specific groups
- An institution like the **Equal Opportunities Commission** of the United States or the United Kingdom is in need
- An audit on performance of employers and educational institutions on non-discrimination and equal opportunity can be undertaken

### Concerns with Tribunals

#### Why in news?

Parliament enacted the Tribunals Reforms Act, 2021 which contained provisions that had been struck down by the Supreme Court in an ordinance issued earlier.

#### What are constitutional provisions regarding tribunals?

- Tribunals were not mentioned in the original constitution.
- They have been added by the **42<sup>nd</sup> constitutional amendment act** based on the recommendations of Swaran Singh Committee.
- **Part XIV-A** has been added to the constitution with respect to tribunals.
- **Article 323A** deals with administrative tribunals which can be established only by the Parliament.
- **Article 323B** deals with other types of tribunals which can be established by both the Parliament and the State Legislature.

#### What are the issues?

- Government pushing the earlier struck provision on selection and tenure of Tribunal members through the new act were against the judgements of the court.
- Unusual delay in filling up vacancies among judicial and administrative members.
- Choosing the members from the waiting list before exhausting the names in the selection list in appointments.
- Reducing the tenure of the Acting Chairperson of National Company Law Appellate Tribunal (NCLAT) by 10 days.
- Disagreements between the government and judiciary on the eligibility criteria and conditions of service of members of tribunal
- Undermining the independence of tribunals.

#### What is the Supreme Court's view?

- The court wants to ensure the independence of tribunals by providing reasonable tenure.
- It has warned that it will suo motu stay the legislation and could consider initiating the contempt of court proceedings.
- The Supreme Court has been repeatedly calling for the establishment of a National Tribunals Commission to make suitable appointments and evaluate the functioning of tribunals.

## Judicial Selection

### Why in news?

The Supreme Court of India's collegium has made proposals to alter the existing composition of various High Courts.

### What is the proposal about?

- New Chief Justices will be appointed to as many as eight different high courts.
- Five existing Chief Justices will swap positions.
- These recommendations are seen as reflective of a new and proactive collegium.
- But the collegium's opacity and a lack of independent scrutiny of its decisions remain a concern.

### What is the procedure for appointment of judges?

- Supreme Court judges are appointed by the President of India in consultation with CJI and other judges that he deems fit.
- High Courts judges are appointed by the President in consultation with CJI, Governor of the State and Chief Justice of that court.
- In case of transfers, President may move a judge from one High Court to another, after consulting the CJI.

### What is a collegiums and how it evolved?

- Constitution - In the original constitution, there is no mention of a –collegium|| .
- The Constituent Assembly adopted a consultative process of appointing judges to ensure that judges remain insulated from political influence.
- It avoided legislative interference and also the undemocratic provision of a veto to the Chief Justice.
- Instead, it vested in the President the power to both make appointments and transfer judges between high courts.
- The President (to act on the advice of the council of ministers) was however required to consult certain authorities such as the CJI or chief justice of the high court appropriately.
- 'Consultation' - The Supreme Court earlier ruled that the word –consultation|| could not be interpreted to mean –concurrence||.
- Accordingly the CJI's opinion was not binding on the executive.
- Nevertheless, the executive could depart from the opinion only in exceptional circumstances and any such decision could be subject to judicial review.
- The system was thus fairly balanced and in the First Judges Case, 1981 the court once again endorsed this interpretation.
- Second Judges Case - In the famous Second Judges Case, 1993 the court however overruled its earlier decisions.
- It now held that –consultation|| meant –concurrence|| , and that the CJI's view enjoys primacy.
- This is with the rationale that CJI could be best equipped to know and assess the "worth" of candidates.
- But, the CJI was to formulate the opinion only through a body of senior judges that the court described as the 'collegium'.



- Collegium - In the Third Judges Case, 1998 the court clarified that the collegium would comprise CJI and four senior-most colleagues, in appointments to the Supreme Court.
- And, the CJI and two senior-most colleagues in the case of appointments to the high courts.
- Additionally, for HCs, the collegium would consult other senior judges in the SC who had previously served in the HC concerned.
- On whether these views of the consultee-judges are binding on the collegium or not, the judgments are silent.
- NJAC - The government, through 99th constitutional amendment, sought to replace the collegium with the National Judicial Appointments Commission.
- The Supreme Court however struck NJAC down.
- The court's rationale was that the NJAC law gave politicians an equal say in judicial appointments to constitutional courts.
- Change - In what might now be called the Fourth Judges Case (2015), the court upheld the primacy of the collegium.
- More importantly it declared collegium as part of the Constitution's basic structure.
- And so its power could not be removed even through a constitutional amendment.
- But given the criticisms against the system, the judgment promised to consider appropriate measures to improve the collegium system.

#### **How can the prestige of High Courts be restored?**

- The constitution envisages no power of administrative superintendence in the Supreme Court over the High Courts.
- But the present system and the mysteries underlining the decision-making can dilute the High Courts' prominence.
- The Chief Justices must be provided with ample tenure through reforms to enable them to bring lasting changes.
- Restoring the prestige of High Courts require more than just a c in the process of appointments.

## **2. GOVERNMENT ACTS & POLICIES**

### **PLI Scheme for Speciality Steel**

#### **Why in news?**

The Union Cabinet recently approved the Production Linked Incentive (PLI) Scheme for specialty steel with an outlay of Rs 6,322-crore.

#### **What is the PLI scheme?**

- For target segments, the scheme provides incentive of 4% to 6% on incremental sales over the base year for goods manufactured in India.
- Apart from inviting foreign companies to set shop in India, it encourages local companies to set up (or expand existing) manufacturing units.
- The scheme came in line with the National Policy on Electronics 2019 to position India as a global hub for Electronics System Design and Manufacturing (ESDM).
- Objectives:
  1. Encourage local production
  2. Reduce India's dependency on imports and cut the import bill
  3. Boost export earnings
  4. Increase the share of manufacturing to 20% by 2025.

### How is the performance so far?

The progress of the PLI scheme has been somewhat slow.

- Of the 13 sectors for which outlays have been finalised, guidelines need to be framed for a few.
- In others, the industry's concerns need to be addressed.
- For textile products and automobiles, the schemes are awaiting Cabinet approval.
- But the auto sector hugely relies on imports for a range of components and is one of the country's biggest employers.

### What is the recent PLI scheme for speciality steel?

- The PLI incentive is expected to boost the domestic production of specialty steel by -
  - i. attracting significant investment
  - ii. infusing technology and know-how
  - iii. promoting exports
- It will apply for the following 5 indicative product categories:
  1. Coated/Plated Steel Products
  2. High Strength/ Wear resistant Steel
  3. Specialty Rails
  4. Alloy Steel Products and Steel wires
  5. Electrical Steel

### What is the rationale?

- There is a huge gap in India between the production of steel and value-added steel i.e., speciality steel.
- But speciality steel has various strategic applications like defence, space, power, etc.
- So, there is a reliance on imports leading to heavy forex outflow given the higher average price per tonne for speciality steel.
- To address this, the direct fiscal incentives in the form of 'PLI' aims to boost manufacturing of speciality steel in India.
- Applicants have also been given the flexibility to avail other Central and State incentives alongside the PLI scheme for their investments.

### Expected outcome

1. Increase production of speciality steel by 140% by FY27, over the baseline period of FY20.
2. Reduced import dependence to the tune of 76%
3. Increase in exports by 244%
4. Compete with Korea and Japan leading in the sector

### What lies ahead?

- For the PLI scheme to work in all the 13 sectors identified, the government must work harder to satisfy the manufacturers' needs.
- The PLI outlay must deliver returns in the form of jobs and worthwhile import substitution, enabling the economy to become part of some global supply-chains.

## Production Linked Incentive Scheme for Textile Sector

### Why in news?

The Union Cabinet approved a Production-Linked Incentive (PLI) scheme for the textile sector worth Rs 10,683 crore.

### What is the scheme about?

- **Aim** - To attract fresh investment of Rs 19,000 crore and an additional turnover of Rs 3 lakh crore in the textile sector
- **Duration of the scheme** – 5 years
- **Segments covered** - High value Man-Made Fibre (MMF) fabrics (viscose, polyester, and acrylic), garments and technical textiles

Technical textiles are engineered products with a definite functionality which are manufactured using natural as well as man-made fibres.

They have enhanced properties such as higher tenacity, excellent insulation, improved thermal resistance, etc.

- The incentives have been categorised into two investment levels.
  1. Any person (firm / company) willing to invest minimum Rs. 300 Crore in Plant, Machinery, Equipment and Civil Works (excluding land and administrative building cost shall be eligible to apply for the first part of the scheme
  2. In the second part any person firm / company) willing to invest minimum Rs. 100 Crore shall be eligible to apply
- **Priority** - investment in Aspirational Districts, Tier 3, Tier 4 towns, and rural areas

### Why is the scheme so significant?

- Help Indian companies to emerge as Global Champions
- Create additional employment of over 7.5 lakh people directly and several lakhs more for supporting activities since textile sector is capital intensive
- Pave way for participation of women in large numbers
- Result in fresh investment
- Prioritise backward areas
- Positively impact especially States like Gujarat, UP, Maharashtra, Tamil Nadu, Punjab, AP, Telangana, Odisha etc
- MMF has contributed less than 30% of the country's \$35.6 billion in overall sectoral exports in 2017-18
- So the scheme is significant to bolster support for the MMF segment

### What are the government initiatives to boost technical textiles market?

- **National Technical Textiles Mission, 2020** - to position India as a global leader in technical textiles by focussing on R&D, skill development, market development and export promotion of technical textiles
- Government of India allows 100% FDI under automatic route
- **Technotex India** - a flagship event organised by Ministry of Textiles, in collaboration with FICCI comprising of exhibitions, conferences and seminars with participation of global stakeholders
- **Harmonized System of Nomenclature (HSN) Codes for Technical Textile** - to monitor the data of import and export, provide financial support and other incentives to manufacturers
- **Scheme for Integrated Textile Park (SITP), 2005** - To boost entrepreneurship by providing financial support and state-of-the-art infrastructure

- **Technology Mission on Technical Textiles**- entailed the creation of eight Centres of Excellence to provide infrastructure support
- **Amended Technology Upgradation Fund Scheme (ATUFS), 2016** - to improve exports and indirectly promote investments in the textile machinery

## Telecom Reforms

### Why in news?

The Cabinet has approved a set of structural and procedural measures to address the issues faced by the telecom sector.

### How did the financial condition of the telecoms deteriorate?

- In 1999, the government decided to shift from a fixed to a revenue-sharing model for the telecom sector.
- Telecom players would pay a certain percentage of their Adjusted Gross Revenue (AGR), earned from telecom and non-telecom revenues, as licence and spectrum fee.
- In 2003, the Department of Telecom (DoT) raised the demand for AGR payments altering the calculation of AGR.
- The telcoms approached the Telecom Disputes Settlement Appellate Tribunal (TDSAT) in 2006 which rejected the government's contention.
- The Centre moved the Supreme Court where the court held that DoT's definition of AGR was the correct one, and that the telcoms must pay the AGR, interest and penalty on non-payment.
- The judgment came when the telecom sector was reeling under stress due to intense competition from Reliance JioInfocomm.

### What are the key reforms?

#### Structural Reforms

- A **four-year moratorium** on payment of dues on adjusted gross revenue (AGR) and on payment of spectrum purchased in past auctions, barring the 2021 auction
- Option to telecoms to pay the interest amount arising due to the deferment of payment by way of equity.
- Rationalization of Adjusted Gross Revenue (AGR) - Non-telecom revenue will be excluded from the definition of AGR.
- Rationalization of Bank Guarantees (BG) - Huge reduction in BG requirements (80%) against License Fee and other similar Levies.
- Rationalization of interest rates and removal of penalties.
- Tenure of spectrum has been increased from 20 to 30 years.
- **100% Foreign Direct Investment (FDI)** under automatic route permitted in Telecom Sector
- **No Spectrum Usage Charge** for spectrum acquired in future spectrum auctions

#### Procedural Reforms

- Auction calendar fixed - Spectrum auctions to be normally held in the last quarter of every financial year.
- Cumbersome requirement of licenses were replaced with self-declaration
- Paper Customer Acquisition Forms will be replaced by digital storage of data
- Know Your Customers (KYC) reforms such as permission of Self-KYC (App based)

### What will be the impact of the reforms?

#### Impact on telecoms

- It will provide relief by easing liquidity and cash flow.
- The four year moratorium will provide short-term relief to debt-laden Vodafone Idea and Bharti Airtel.

- Streamlining of auction calendar and removal of spectrum usage charges might bring down the dues outgo and help telcoms plan their auction purchase.
- Ease of doing business promoted by removing the requirement of licenses.
- 100% FDI under automatic route will promote investments.

#### **Impact on Government**

- It will face some revenue loss in the next four financial years because of the moratorium.
- Receipts from spectrum usage charges, licence fee levies and other levies will have to be forgone for the next 4 years.
- Option of converting the due into equity will be a challenge for the government to sell the stake later if market conditions do not improve.

### **3. SOCIAL JUSTICE**

#### **Compulsory Registration of Child Marriages**

##### **What is the issue?**

Rajasthan's amendment to Compulsory Registration of Marriages Act, 2009, which provides for mandatory registration of marriages, including child marriages has created a lot of controversy.

##### **What law prohibits child marriage?**

- The **Prohibition of Child Marriage Act, 2006** is enacted for the prohibition of solemnisation of child marriages.
- A male who has not completed 21 years of age and a female who has not completed 18 years of age is a 'child' for the purpose of this Act.
- Section 3 of the Act makes the child marriages voidable at the option of contracting party being a child.
- Delhi High Court in **Lajja Devi vs. State NCT of Delhi** said that the 2006 Act does not make a child marriage void per se but only declares it as voidable.
- The Supreme Court in **Independent Thought vs. Union of India** found that the 2006 Act while prohibiting a child marriage and criminalizing it does not declare it void.

##### **What is the background to compulsory marriage registration laws?**

- The Supreme Court in **SeemavsAshwani Kumar case** held that marriages of all citizens of India belonging to various religions should be made compulsorily registrable in their respective States where the marriage is solemnized.
- So, Rajasthan Compulsory Registration of Marriages Act, 2009 was enacted for compulsory registration of marriage and procedure.
- The act makes it a duty of the parties to submit such a memorandum within a period of thirty days from the date of solemnization of the marriage to the Registrar.
- If the parties have not completed the age of 21 years, the parents or guardian of the parties shall be responsible to register the marriage.
- Penalty for non-registration is punishable with fine.

##### **What is the new amendment about?**

- The amendment provides that if the bride hasn't completed 18 years of age and/or the groom hasn't completed 21 years of age, then their parents or their guardians should register the marriage within 30 days.
- It was alleged by opposition that it justifies child marriage for the state giving certificates to minor kids.
- But the government argues that the bill doesn't make the marriage legal and the District Collector can take action against them.

##### **How can the issues be addressed?**

- As recommended by the Law Commission of India, the Centre can amend the 2006 Act to declare that child marriage below 16 years void, and those solemnised when either party was between 16 and 18, voidable.
- States of Karnataka and Haryana has made child marriage below certain years as void.
- The Rajasthan act should have provided for a route for prosecution of illegal child marriages as like the Uttarakhand Act.
- Even if there is no such provision, the Registrars as observed by the Kerala High Court, can intimate the Child Marriage Prohibition Officers and help prosecution of offenders.

### **Caste-Based Census**

#### **What is the issue?**

There have been mounting demands on caste based census coming from different quarters of the country.

#### **What is caste census?**

- Caste census is the procedure of systematically acquiring and recording the caste-wise tabulation of India's population

#### **What is the need for such a demand?**

- To justify the preservation of caste-based affirmative action programmes for better planning and targeting of welfare schemes
- To provide quantifiable data to support the existing levels of reservation as required by Supreme court for groups like OBC
- To favour the political parties if particular groups are established as dominant in specific geographies
- To debate on issues like disproportionate benefits from reservation by particular groups within each category
- To address the inequities in the society

#### **What is the government's stand?**

- The Union of India after Independence decided as a matter of policy not to enumerate caste wise population other than SCs and STs.
- The government cites that a census of the backward castes is administratively difficult and cumbersome
- Having caste as a part of census is so complex that it may jeopardise the decennial census itself.
- Very high number of castes and sub-castes with phonetic variations and similarities adds to the burden
- Even the Census of 1931 that included caste was not complete and accurate
- The caste census might evoke varying responses from different groups
- Government argues that caste-based census is against the idea of a casteless society

#### **What are the gaps in the existing caste data?**

- There is a Central list of OBCs and State-specific list of OBCs.
- Some States do not have a list of OBCs.
- Some States have a list of OBCs and a sub-set called Most Backward Classes.
- There are certain open-ended categories in the lists such as orphans and destitute children.
- Names of some castes are found in both the list of Scheduled Castes and list of OBCs.
- Scheduled Castes converted to Christianity or Islam are also treated differently in different States.
- The status of a migrant from one State to another and the status of children of inter-caste marriages, in terms of caste classification, are also contentious.

#### **How can the differences be accommodated?**

- A preliminary socio-anthropological study can be done at the State and district levels to establish all sects and sub-castes present in the population
- These can be tabulated under caste names that have wider recognition based on synonymity and equivalence

- Thereafter, it may be possible to do a field enumeration that can mark any group under castes found in the available OBC/BC lists.

## 4. HEALTH

### Understanding Why Kerala's Covid Caseload Remains High

#### What is the issue?

There has been growing concerns with Centre briefing that Kerala contributed to over 50% of the country's COVID cases

#### What are the centre's reasons for high caseload?

- **Intra-house transmission** - The rural-urban divide is very faint in Kerala leading to high intra-house transmission
- **Reinfections** - Kerala is witnessing high reinfections among the people who have received both doses of vaccine
- **Non-Communicable Diseases (NCD)** - High prevalence of NCD is yet another factor responsible for higher disease spread
- **High life expectancy** - As Kerala has high life expectancy, it has a higher proportion of those who are easily susceptible to the virus.
- **Migration** - Massive migration of people from within India and abroad is another cause for the virus spike
- **Containment zones** - Kerala has also not defined containment zones according to Centre's guidelines
- **Containment classification** - Kerala reviewed its containment classification as per 7 day moving average but it actually takes 14 days
- **Unlocking process** - Relaxations for tourism and the impending Onam festival has aggravated the situation.

#### What is the other side of the view?

- **Measure of case fatality** is not an appropriate comparison across the population
- The fatality associated with Covid-19 intensified with pre-disposed risks of the patient as well as the age profile.
- **Comparability of Test Positivity Rates (TPR) levels** - Comparability not only depends on the magnitude of testing but also the testing protocols adopted by the health system.
- In Kerala, testing is done in clusters where the likelihood of positivity is obviously greater than the general population.
- **Extent of testing** - Greater access to testing and greater sensitivity to the spread of Covid-19 makes Kerala's numbers higher.
- However, Kerala's case fatality rate as of August 20 remains among the lowest (0.51) of all Indian states and against a national average CFR of 1.36.

#### How can a genuine comparative assessment be done?

- The entire road from the detection of infection to recovery has to be evaluated

- The evaluation should include the number of patients needing hospitalised care, the rate of their progression to oxygen dependence, ICU care and ventilators and finally, fatalities, etc.
- Comparative evaluation of this kind in many of the northern and eastern states needs adequate infrastructure.

## 5. GOVERNANCE

### Tackling Hate Speech

#### What is the issue?

Recently, a speech by a Kerala Bishop has caught attention for accusing a few Muslim groups of giving Catholic girls narcotics or wooing them with the aim of religious conversion terming it as '**narcotic jihad**'.

#### What is hate speech?

- Hate speech is an incitement to hatred against a particular group of persons marginalised by their religious belief, sexual orientation, gender, and so on.
- The U.S. Supreme Court in ***Chaplinsky v. New Hampshire, (1942)***, established the doctrine of fighting words which inflicts injury or tend to incite an immediate breach of the peace.
- In India, hate speech is **not defined** under the Constitution or in the penal statutes.
- There is no specific legislation on hate speech.
- But, **Section 153-A of IPC** prohibits -promoting enmity between different groups on grounds of religion, race, place of birth, residence, language, etc.]

#### Why is this issue a serious concern?

- Hate speech infringes the dignity and equality of individuals.
- It creates barriers of mistrust and hostility between individuals and groups, plants fears and obstructs normal relations.
- In ***Pravasi Bhalai Sangathan v. Union of India (2014)***, the Supreme Court of India quoted from the Canadian Supreme Court's decision in ***Saskatchewan v. Whatcott (2013)***.
- It said that the hate speech places a serious barrier to the full participation of groups such as minority in our democracy.
- Relentless accusations have led to cases of violence carried out solely on the basis of identity.

#### What does this incident call for?

- Hate speech has to be countered with political and jurisprudential means.
- There is a need for political and pedagogical solution to the menace.
- The Constitution's ideas of equality, liberty and fraternity must be educated among the masses.
- Whenever hate speech thrives, the state should invoke the existing law judiciously in appropriate cases and must take a secular stand based on the rule of law.
- The Law Commission in its **267th report** on hate speech has proposed **Section 153C** which penalises incitement to hatred with two years' imprisonment or Rs. 5,000 in fine or both.
- It has also proposed **Section 505A** to punish speech or writing that causes fear or alarm among a group, or provokes violence on grounds of race, religion, gender, sexual orientation, place of birth or disability.

### PM CARES: A fund without a care for the RTI

#### Why in news?

The Government has recently claimed that the PM CARES Fund is not a public authority.

#### What is PM-CARES Fund?

- In March 2020, Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund or PM CARES Fund was set up to tackle distress situations such as that posed by COVID-19 pandemic.



- The fund receives voluntary contributions from individuals and organizations and does not get any budgetary support.
- Donations have been made tax-exempt, and can be counted against a company's corporate social responsibility (CSR) obligations.
- It is also exempt from Foreign Contribution (Regulation) Act, 2010, and accepts foreign contributions, although the Centre has previously refused foreign aid to deal with disasters such as the Kerala floods.
- The Prime Minister chairs the fund in his official capacity, and can nominate three eminent persons in relevant fields to the Board of Trustees.
- The Ministers of Defence, Home Affairs and Finance are ex-officio Trustees of the Fund.

#### **What are the issues with the PM-CARES Fund?**

- Neglection of other funds such as National Disaster Response Fund (NDRF), Prime Minister's National Relief Fund (PMNRF), etc.
- The PM CARES Fund was neither created by Constitution of India nor by any statute raising questions on what authority does it use the designation of Prime Minister, designated symbols of the nation, official (gov.in) website of PMO, tax concessions through an ordinance, etc.
- The amount collected by it does not go to the Consolidated Fund of India and hence it is not audited by CAG raising suspicions on accountability and transparency.
- There is no control of either the Central Government or any State Government in the functioning of the trust.
- If PM CARES Fund is unconnected with the Government, then the Fund could become an office of profit and could disqualify Prime Minister and the three Ministers from holding the constitutional offices.
- Section 19 of Indian Trusts Act mandates the trustees to present information regarding the trust property to the beneficiaries, thus PM CARES Fund should be accessible as per Section 2(f) of RTI Act.
- The substantial control exerted by the trustees is a test to determine its character as a public authority under the RTI Act as highlighted in *Thalappalam Service Coop. Bank Ltd. vs State of Kerala* case.
- The PMO is a public authority and has to give us answers about the fund under the RTI.

#### **Quick facts**

##### **National Disaster Response Fund (NDRF)**

- It was established under the Disaster Management (DM) Act of 2005.
- The NDRF is mandated to be accountable and answerable under the RTI Act being a public authority.
- It is auditable by the Comptroller and Auditor General of India.
- The DM Act provided for a Disaster Response Fund — state and district level funds (besides the national level).

##### **Prime Minister's National Relief Fund (PMNRF)**

- PMNRF was set up in January 1948 originally to accept public contributions for the assistance of partition refugees.
- It is now used to provide immediate relief to the families of those killed in natural calamities and the victims of major accidents and riots and support medical expenses for acid attack victims and others.
- The PMNRF was originally managed by a committee which included the Prime Minister and his deputy, the Finance Minister, the Congress President, a representative of the Tata Trustees and an industry representative.
- However, in 1985, the committee entrusted the entire management of the fund to Prime Minister, who currently has sole discretion for fund disbursal.
- A joint secretary in the PMO administers the fund on an honorary basis.
- As of December 2019, the PMNRF had an unspent balance of Rs.3,800 crore in its corpus.
- States also have similar Chief Minister's Relief Funds.
- PMNRF provides annual donation and expenditure information without any detailed break-up.

## **6. INDIA & ITS NEIGHBORHOOD**

### **India's Engagement with Taliban**

#### **What is the issue?**

India adopted UN Security Council's (UNSC's) resolution 2593 that aims to address the New Delhi's key concerns regarding the country

#### **What is UNSC resolution 2593 all about?**

- The resolution demands that Afghan territory should not be used to threaten/attack any country or to shelter/ train terrorists or plan/finance terrorist acts
- It was put forward by US, UK, and France and adopted after 13 council members voted in favour
- The permanent members Russia and China abstained from voting
- It specifically mentions individuals and entities designated by UNSC Resolution 1267, i.e., Lashker-e-Taiba (LeT) and Jaish-e-Mohammed (JeM)

#### **What is the significance of the resolution?**

- Strong signal from the UNSC and the international community on its expectations in respect of Afghanistan
- Called on the Taliban to keep its commitments on preventing terror groups in Afghanistan
- Urged Taliban to assist the safe evacuations of Afghan nationals wishing to leave the country
- Addressed the concerns of anti- Indian terror outfits like LeT and JeM

#### **Why did Russia and China abstain from voting?**

- Demand of inclusion of groups like Islamic State (ISIL) and Uighur East Turkestan Islamic Movement (ETIM) in the document
- Non inclusion of freezing Afghan financial assets in the document
- The resolution was alleged to be unbalanced and forcefully pushed through

#### **What are the recent developments of India's engagement with Taliban?**

- Ministry of External Affairs announced that its Ambassador to Qatar Deepak Mittal met with the head of the Taliban's political office
- Discussions were on safety, security and early return of Indian nationals stranded in Afghanistan
- Also focused on Afghan nationals, especially minorities
- Demanded that Afghanistan's soil should not be used for anti-Indian activities and terrorism in any manner
- Taliban leader assured that all the issues would be positively addressed

#### **What would be India's future course of action?**

- Concerns about the Haqqani group, which is a part of the Taliban who attacked the Indian Embassy in 2008-2009
- Being in touch with -various stakeholders in Afghanistan and meeting with Taliban representatives
- -Wait and watch the Taliban's actions with regard to human rights, treatment of women and minorities, attitude towards terror groups, etc.

### **Sri Lanka's National 'food emergency'**

#### **Why in news?**

Sri Lankan government has announced food emergency to check the soaring prices of food and hoarding of essentials by a food mafia.

### **What are the issues hampering the Sri Lankan government?**

- Huge foreign debt burden
- Decline in tourism industry since the 2019 Easter attacks
- Pandemic hit tea and garment industries
- Decreasing foreign exchange reserves
- Devaluation of currency by 10.1% against the dollar this year
- Imports became costlier
- Increase in liquidity due to Rs 800 billion printed by the Central Bank of Sri Lanka
- Sharp spike in inflation
- Fixation of prices of all essential items made traders reluctant to buy at high prices internationally
- Restrictive import licensing regime
- Ban on chemical fertilisers to grow only organic food aggravated the shortage

### **What is the current emergency about?**

- The emergency has been declared under the legal framework of the Public Security Ordinance (PSO).
- It empowers the President to declare a State of Emergency in two situations when the President is of the opinion that it is
  1. in the interest of public security and the preservation of public order
  2. for the maintenance of supplies and services essential to the life of the community
- President is now able to promulgate Emergency Regulations dealing with any subject at any given time
- While the emergency has to be taken to Parliament for renewal every three months, the President is empowered to bring in regulations that do not need parliamentary oversight or approval
- It must be recognised as a **temporary** conferral of extraordinary power for the government during times of acute crisis and not a substitute for the normal legal regime

### **What are the counter arguments against the proclamation of emergency?**

- Opposition members argued that other legislations were available to check hoarding and cap food prices
- The appointment of a serving major general as the Commissioner General of Essential Services has raised concerns of bypassing the civilian administration
- It was alleged that emergency was proclaimed to violate the freedom of expression, movement, etc
- Ill-timed decision to switch from chemical to organic fertilizer might lead to food crisis.

### **China's Evergrande Crisis**

#### **What is the issue?**

Chinese real estate conglomerate Evergrande Group has been in the news recently over its inability to pay interest on its huge debt obligations.

#### **What is the trouble at Evergrande?**

- The Evergrande Group is China's second-largest real estate company in terms of total sales and employs over 200,000 employees.
- Its core business deals with buying land, developing them into houses, restaurants and so on and selling them to interested buyers
- The company uses large amounts of debt from banks and investors as well as short-term loans to fund its business.
- It has total liabilities worth over \$300 billion and has to pay around \$37 billion in interest and maturing debt over the next year.
- Its share price has dropped over 80% in the last one year and hit a 10-year low.

- The company has also taken money in advance from buyers and from its own employees but has defaulted on these products

#### Why is the company in trouble?

- Almost a third of the Chinese GDP is made up of the property sector with Chinese authorities traditionally encouraging businesses to take on huge amounts of debts
- But the recent Chinese government's rules for property developers called **three red lines** that states how much a property developer can borrow given its financial position as measured by three debt metrics
- This policy practically cut off Evergrande from taking on any more debt on its balance sheet
- Some analysts argue that the company's business model has been unsustainable for a long time.
- It was said that the company held properties that it could not sell on its balance sheet as inventory to avoid booking of losses.
- The company was also accused of running a ponzi scheme as it needed constant inflow of funds to prop up a business model that is fundamentally unsustainable
- Many have called the Evergrande crisis **China's own 'Lehman moment'** where the failure of U.S. bank Lehman Brothers precipitated the 2008 financial crisis

#### What lies ahead?

- Any bailout by Chinese government will require the creation of a fresh supply of money which in turn will debase the value of the Chinese currency.
- Foreign investors with exposure to Evergrande may experience losses.
- Any slowdown in the Chinese economy in the course of rebalancement away from the property sector will have effects on the global supply chain.
- For instance, metal stocks in India have witnessed a sharp correction in attribution to fears of a slump in Chinese demand.
- Some critics have warned investors to refrain from investing in China pointing to the absence of the rule of law.
- Some analysts believe that Chinese growth could drop to as low 1-2% as the country massively rebalances its economy.

## 7. INTERNATIONAL ISSUES

### US-North Korean Nuclear and Missile Diplomacy

#### Why in news?

North Korea has resumed back its largest fissile material production reactor at the Yongbyon complex which was ceased back in 2018.

#### What are the developments in Pyongyang's Nuclear Programme ?

##### During 20<sup>th</sup> century:

- In 1994, Pyongyang barred IAEA access to the Yongbyon complex
- A peace deal called **1994 Agreed Framework** was signed by President Bill Clinton, requiring Pyongyang to freeze all nuclear activity and allow inspection of its military sites in return for the construction of two light water reactors.
- But the accord broke down in 2002

##### During the tenure of President George W. Bush:

- North Korea unilaterally withdrew from Non-Proliferation of Nuclear Weapons Treaty (NPT) in 2003
- It is not a party to CTBT and Chemical Weapons Convention
- President George W. Bush referred North Korea as a part of the –axis of evil

- North Korea was placed on the terrorism list after the 1987 bombing of a South Korean airplane
- In order to enforce its denuclearisation commitment, Pyongyang blew up the cooling tower at the Yongbyon complex in 2008
- Later it barred IAEA inspectors access to its reprocessing plant in the Yongbyon complex as late as 1994

#### **During the tenure of President Donald Trump:**

- In 2017, North Korea successfully tested its first intercontinental ballistic missile (ICBM), and conducted a thermonuclear weapon test
- In 2019 North Korea offered to fully dismantle in exchange for securing complete relief from international economic sanctions
- North Korea resumed its short-range ballistic missile tests after the bilateral talks stalled

#### **During the tenure of President Joe Biden:**

- The Biden administration has declared its readiness to resume negotiations with Pyongyang
- But Mr. Kim has overturned the offers until sanctions are removed
- Yongbyon complex resumed its operation to generate plutonium and highly enriched uranium for the development of atomic bombs
- Also, North Korea test fired its first strategic cruise missile with possible nuclear capability recently
- North Korea's missile capacity has been enhanced to strike even the territory of U.S.

#### **How does U.S. perceive the North Korea's actions?**

- North Korea holding to the **deterrence theory** that nuclear weapons are intended to deter other states from attacking appears hollow
- The UN treaty on complete abolition of atomic arms is the morally superior alternative
- The U.S.'s key goal in northeastern Asia is the de-nuclearisation of the Korean peninsula and it views diplomacy as the only practical way to achieve this

### **The AUKUS Agreement**

#### **Why in news?**

The United States, United Kingdom, and Australia announced a new trilateral security partnership called the AUKUS

#### **What is the agreement about?**

- The agreement aims to ensure that there will be enduring freedom and openness in the Indo-Pacific region.
- Under the agreement, America and Britain proposed to transfer technology to build a fleet of nuclear-powered submarines for Australia within 18 months.
- With this Australia becomes the second nation after U.K. that the U.S. has ever shared its nuclear submarine technology with.
- The submarines are to be conventionally armed and are powered by nuclear reactors.
- It will give Australia naval heft in the Pacific, where China has been particularly aggressive.
- The partnership complements several pre-existing similar arrangements for the region like Five Eyes intelligence cooperation initiative, ASEAN, Quad, etc.
- The Five Eyes is an intelligence-sharing alliance consisting of the US, UK, Australia, Canada & New Zealand. The origins of the Five Eyes can be traced back to WW II.

#### **What makes nuclear submarines so important?**

- A nuclear-powered submarine is classified as an –SSN under the US Navy hull classification system.
- Since SSN's are propelled by a nuclear-powered engine rather than by batteries, they don't have to emerge on the surface except to replenish supplies for the crew.
- SSNs are also able to move faster underwater than the conventional submarines.

- They have the capability to go into the South China Sea at a higher speed without being detected.

#### **What is the fuss over the agreement?**

- New Zealand has announced that under its 1984 nuclear-free zone policy, Australia's nuclear-powered submarines would not be allowed into the former's territorial waters.
- France is also upset with Australia upon cancellation of the earlier struck deal worth \$90 billion of conventional submarines.

#### **What are the opportunities of AUKUS for India as a QUAD member?**

- AUKUS could strengthen the Quad's agenda to keep the Indo-Pacific region free, open and inclusive.
- It could bolster the Quad's efforts on maritime exercises, security and countering COVID-19, climate change, cooperating on critical technologies, and building resilient supply chains.
- US's comeback on partnerships with fellow democracies and engaging with Indo-Pacific flank is in line with India's hopes.
- India views that AUKUS is not a substitute for the Quad as Quad focuses on a much broader theme beyond maritime security.

#### **What are the concerns over AUKUS?**

- The timing of the announcement of AUKUS just before the Quad leaders meet could overshadow the latter.
- It might signal that the U.S. is engaging with the Quad to less substantive issues in the Indo-Pacific.
- U.S. is now promoting a security partnership with its –Anglo-Saxon treaty allies upsetting the balance of power in the region.
- India views that the agreement could set off new tensions to India's east adding to the substantial turbulence in India's west caused by the developments in Afghanistan.
- India does not see AUKUS as nuclear proliferation but it has noticed the protests from others, especially France as a concern.

#### **What are the differences and similarities between AUKUS and QUAD?**

- AUKUS was just announced on 15<sup>th</sup> September 2021 whereas QUAD was in the making since 2007.
- AUKUS is a security/military alliance while Quad is a diplomatic alliance.
- The countries under AUKUS include Australia, USA and UK whereas QUAD includes United States, India, Japan and Australia.
- AUKUS specifically will deal with the security and military situation in the Indo-Pacific region whereas QUAD focuses on multilateral issues -- ranging from economic discussions, security affairs & global affairs.
- In AUKUS, Australia would be helped to develop nuclear powered submarines but in QUAD only military exercises like Malabar are conducted but no nuclear submarines are developed.
- One similarity is that both the groups have a common interest in protecting the Indo-Pacific region from China's dominance over other nations.

## G.S PAPER III

### 8. ECONOMY

#### India GDP Q1 data 2021-2022

##### Why in news?

Ministry of Statistics and Programme Implementation (MoSPI) released the GDP data for the first quarter of the current financial year (2021-22)

##### What are available data for Q1?

- Growth - Lockdown due to the pandemic had nearly halted all economic activities in April-June 2020. (GDP had contracted 24.4%).
- But the economy grew at a pace of 20.1% in April-June 2021 compared to April-June 2020.
- GVA grew by 18.8%
- This high growth rate has come despite a brutal 2<sup>nd</sup> wave of in April-May 2021.
- Characteristics - Certain high frequency indicators such as power generation, fuel consumption and railway freight indicated that rebound has been faster after Covid 2.0 than Covid 1.0.
- However the pace of recovery is still considered slow.
- GDP in absolute terms at Rs 32.38 lakh crore (constant prices) is still 9.2% lower than the GDP in pre-pandemic time.
- Sectors - Manufacturing and construction imparted a significant push to the economy growing at 49.63% and 68.3% respectively.
- But they are yet to reach the levels of the 2019-20.
- Services, especially contact-intensive sectors, however, continued to lag.
- Agriculture, forestry and fishing' and 'electricity, gas, water supply and other utility services are above the levels of the of 2019-20.
- In terms of expenditure, Private Final Consumption Expenditure grew 19.34%, and Gross Fixed Capital Formation jumped 55.26%.
- Private Final Consumption Expenditure - measure of consumer spending
- Gross Fixed Capital Formation - measure of private investment

##### What are the reasons?

- The sharp increases were largely due to the low base of the first quarter of 2020-21.
- The recovery is likely to deepen with further easing of curbs and faster vaccination.

##### How is the growth seen by experts?

- Chief Economic Adviser - GDP data for the 1<sup>st</sup> quarter reaffirms the government's prediction of an imminent V-shaped recovery made last year.
- Others - The headline number cannot be interpreted as a V-shaped recovery.
- 2019-20 level was in itself seen as a disastrous year for growth.
- And the the fact that the economy has still not recovered to those levels is not good news.
- The 2<sup>nd</sup> quarter numbers would be the real test of the shape of the recovery.

##### What does this call for?

- As the growth is below the RBI's projection of 21.4%, it will maintain status quo on key policy rates



- A full economic recovery would require the support of both fiscal and monetary policies
- From a policy perspective, recovery requires fuller levels of vaccination and improved public confidence

### **Consultative Document on Regulation of Microfinance**

#### **Why in news?**

RBI recently released Consultative Document on Regulation of Microfinance that aims to reassess the priorities of the sector

#### **What is microfinance?**

- Microfinance is a form of financial service which provides small loans and other financial services to poor and low-income households.
- In India, all loans that are below Rs. 1 lakh are considered as microloans.
- Based on the recommendations of **Malegam Committee**, RBI introduced a comprehensive regulatory framework for NBFC-MFIs in 2011.

#### **What are the key proposals?**

- Gives a common definition i.e **Collateral-free** lending to households with annual income of Rs 1.25 lakh in rural areas and Rs 2 lakh in urban areas should be considered as microfinance.
- Caps loan repayment (principal and interest) for all outstanding loans of the household at 50% of household income.
- All Regulated Entities to have a board-approved policy for household income assessment.
- No pre-payment penalty.
- Greater flexibility of repayment frequency for all microfinance loans.
- Prescribed criteria for exemption of 'not for profit' microfinance companies.
- Alignment of pricing guidelines for NBFC-MFIs with guidelines for NBFCs.
- Introduction of a standard simplified fact sheet on pricing of microfinance loans for better transparency.
- Display of minimum, maximum and average interest rates charged on microfinance loans on the websites of regulated entities.

#### **What is the significance of the proposal?**

- The proposed framework is a great leap forward and reflects bold thinking
- Avoids over-indebtedness and multiple lending
- Addresses the concern of low-income borrowers who often lack the type of collateral often preferred by the lenders

#### **What are the challenges?**

- Low-Income Households who typically form the customer base for often have seasonal and volatile incomes
- It is difficult to separate the household's personal expenses from that of their occupational pursuits

#### **How can the challenges be addressed?**

- A structured survey-based approach could be used to assess a household's expenses, debt position and income from various sources of occupation
- A template-based approach where various templates for different categories of households (as per location, occupation type, family characteristics, etc.) could be used
- Centralised database can be used to collect and maintain household income data for uniformity in data collection
- Technology can be used to assess the cash flows and repayment capacity of micro-enterprises
- An overarching set of principles to prevent mis-selling by retail lenders is needed



## Enforcing Contracts Key to 'Ease Of Business'

### What is the issue?

Enforcement of contracts is seen as the potential area for rapidly boosting India's global ranking in the World Bank's Ease of Doing Business Index.

### What is India's progress in enforcing contracts?

- India ascended to 63<sup>rd</sup> position in 2020 from 142<sup>nd</sup> position in 2014
- India's progress has seen improvement in a few parameters, mainly in resolving insolvency
- But it has remained stagnant at 163 in enforcement of contracts

Enforcing contracts indicator measures the time and cost for resolving a commercial dispute through a local first-instance court and evaluates whether each economy has promoted quality and efficiency in the court system

### Why does enforcing contracts matter?

- Rule of law and effective protection of rights promotes economic and social progress
- More developed credit markets and a higher level of development overall
- Rapid growth of small firms
- Improves the business climate, fosters innovation, attracts foreign direct investment and secures tax revenues

### What steps have been taken to enforce contracts?

- Justice Department has launched **Enforcing Contracts Portal** that aims to promote ease of doing business and improve Contract Enforcement Regime in the country
- Two high level task forces in NITI Aayog have been set up to give recommendations for a policy framework for enforcement of contracts and an effective conciliation mechanism
- The government has decided to scrap the 'retrospective taxation amendment' of 2012 strengthening the trust between government and industry
- Use of Alternate Dispute Resolution (ADR) to de-log India's legal case pendency
- India is also a signatory to the **New York Convention** for recognition and enforcement of foreign arbitral awards
- Centre and State governments decided to review and systematically phase out over 6,000 tedious compliances
- While India has consistently improved its score in EoDB, there is still a long way to go

## CBDT Rules on EPF Taxes

### Why in news?

CBDT has notified the rules regarding the taxation of the interest on the excess Employees' Provident Fund contributions.

### What is the Employees Provident Fund?

- EPF is a retirement benefit plan, and is the main scheme under the Employees' Provident Funds and Miscellaneous Provisions Act, 1952.
- The scheme is managed under the aegis of Employees' Provident Fund Organisation (EPFO).
- The scheme covers every establishment in which 20 or more people are employed, and other organisations too, subject to certain conditions and exemptions.
- An employee has to pay a certain contribution towards the scheme, and an equal contribution is paid by the employer.
- On retirement, the employee gets a lump sum amount including self and employer's contribution with interest on both.

- Under the Voluntary Provident Fund (VPF), an employee can voluntarily pay higher contribution above the statutory rate of 12% of basic pay.

### What are provident fund taxes?

- Some employees were contributing huge amounts to the EPF and getting tax exemption benefit at all stages - contribution, interest accumulation and withdrawal.
- So, Budget 2021 proposed that tax exemption will not be available on interest income on PF contributions exceeding Rs 2.5 lakh in a year.
- This only excludes the high net-worth individuals (HNIs) from the benefits, and will not affect other workers.
- The latest CBDT notification clarifies on how the taxable interest will be calculated and separated from the non-taxable portion.

### What are the CBDT rules?

The rules were notified by the Finance Ministry through an amendment to the Income-Tax Rules, 1962. This will come into effect from April 1, 2022.

- **Limits** - Interest on EPF and VPF contributions above Rs 2.5 lakh (non-government employees) and above Rs 5 lakh (government employees) in a financial year will be taxable.
- **Separate accounts** within the provident fund account shall be maintained during and from the financial year 2021-22, to manage taxable contribution and non-taxable contribution separately.
- **Non-Taxable Contribution** will include -
  1. balance of the provident fund as on March 31, 2021 [i.e., contributions made in the previous years]
  2. contributions made during financial year 2021-22 and subsequent years within the threshold limits (Rs. 5 / 5 lakh)
  3. the interest component on the above
- **Taxable contribution** will include contributions during the previous year (2021-22) and subsequent years in excess of the threshold limit.
- Clearly, the changes will not affect the salaried individuals' (contributing to EPF) existing corpus or the aggregate annual interest on that.
- **Taxed for perpetuity** - The interest income on contribution beyond the limit for a particular year will get taxed every year thereafter.
- E.g., If annual contribution of a person to PF in FY22 is Rs 10 lakh, the interest income on Rs 7.5 lakh will get taxed not only for FY22 but also for all subsequent years. (Needless to say, the corpus earns interest.)

### What are the challenges?

- The EPFO is yet to formalise the separation of taxable and non-taxable contribution in their accounts, as this will take time.
- Data will have to be aggregated and then the separate accounting process has to be determined for such accounts.

## RBI and G-Secs Market

### Why in news?

The RBI Governor, Shaktikanta Das, recently emphasized that the RBI should continue to remain the regulator for the government securities (G-sec) market.

### What are government securities?

- Government securities (G-Secs) are debt instruments issued by a sovereign government to borrow money.
- The investor buys the bonds and loans money, and in turn, receives fixed interest.
- This is for a defined period of time (till maturity date) and for a variable or fixed interest rate (coupon rate).
- The two key categories are:
  1. Treasury bills - short-term instruments which mature in 91 days, 182 days, or 364 days
  2. Dated securities - long-term instruments, which mature anywhere between 5 and 40 years
- G-secs are considered the safest form of investment because they are backed by the government and the risk of default is almost nil.
- However, they are not completely risk free given the fluctuations in interest rates. Also, G-secs are not tax-free.
- In India, G-Securities are issued by the central government while SDL (state development loans) are issued by the state governments.

### What is the recent concern?

- SEBI's Chairman recently called for unification of corporate and government bond markets under the SEBI.
- The RBI has been facing criticism due to the manner in which it is controlling government bond yields.
- There seems to be a conflict of interest with its other objectives such as inflation management and orderly functioning of the financial market.

### What is the challenge in handling this?

- The bond prices and yields generally move in opposite directions. This is because, as a bond's price increases, its yield to maturity falls.
- The price of a bond primarily changes in response to changes in interest rates in the economy.
- When the government demands so much money, the price of money (i.e., the interest rate) will move up.
- So, yield management / low bond yields are needed to -
  1. bring down the borrowing cost of government
  2. control the interest burden
  3. kick-start investments
- But at a larger level, this has revived the debate over whether public debt management should still remain with the RBI.

### Why should public debt management remain with the RBI?

- The Union government has planned to borrow Rs 12 lakh crore from the market in financial year 2021-22.
- Also, given the ongoing crisis (amidst the pandemic), the RBI needs all its powers to support the government.
- The market intelligence that comes from this role is an advantage.
- Control over the G-sec market is critical in order to discharge many other RBI's key functions:
  1. management of systemic liquidity
  2. regulating foreign exchange market
  3. maintaining financial stability
  4. keeping exchange rate stable
  5. keeping interest rates across maturities under check
- Other factors are composition of participants, their temperament and behaviour in opting for G-Secs, and risk management and surveillance.

### How is it elsewhere?

- Public debt management is a function under the Bureau of Public Debt under the US Treasury Department.
- In the UK, the Debt Management Office functions under the Treasury department.

### **What was the earlier attempt in India?**

- There was a proposal in 2018 to set up public debt management cell in the Budget division. But there has not been much progress on this since.
- For now, the RBI should not be disturbed in its functioning and powers.

### **Account Aggregators Why**

#### **in news?**

Recently eight of India's major banks joined the Account Aggregator (AA) network that will enable customers to easily access and share their financial data

### **What is an Account Aggregator?**

- It is a Non-Banking Financial Company engaged in the business of providing the service of retrieving or collecting financial information pertaining to its customer, under a contract.
- It was created through an inter-regulatory decision by RBI and other regulators including SEBI, IRDA, and PFRDA through an initiative of the Financial Stability and Development Council (FSDC)
- The objective of Account Aggregator (AA) is to aggregate all financial information of an individual

### **How does it work?**

- It has a three-tier structure
  1. Account Aggregator
  2. FIP (Financial Information Provider)
  3. FIU (Financial Information User)
- An FIP is the data fiduciary, which holds customers' data. It can be a bank, NBFC, mutual fund, insurance repository or pension fund repository
- An FIU consumes the data from an FIP. An FIU is a lending bank that wants access to the borrower's data to determine if the borrower qualifies for a loan
- Banks play a dual role – as an FIP and as an FIU
- There are 19 categories of information that fall under 'financial information', besides various other categories
- For sharing of such information, the FIU is required to initiate a request for consent by way of any platform/app run by the AA.
- Such a request is received by the individual customer through the AA, and the information is shared by the AA, after consent is obtained

AA will not provide any transaction in financial assets by its customers. His only role will be that of account aggregation

### **What is the significance of NBFC-AA?**

- Provides information on various accounts held by a customer in a consolidated, organised and retrievable manner
- Better understanding about the potential customers, make informed decisions and ensure smoother transactions
- Help consumers and businesses access financial services, such as loans reducing the need for individuals to wait in long bank queues
- Help banks reduce transaction costs, thus offering lower ticket size loans and more tailored products and services to customers
- Data transmitted through the AA is encrypted and are not allowed to store, process and sell the customer's data hence protecting customer privacy

## **e-Shram Portal - Securing labour**

### **Why in news?**

The Centre recently launched the e-Shram portal to create a national Aadhaar-seeded database of unorganised workers.

### **What is the e-Shram portal?**

- The portal is expected to create a unified **database for unorganised workers to help them access various benefits** of central and state government welfare schemes.
- Unorganised workers form over 80% of the workforce - self-employed, migrant and MSME workers.
- The aim is to register 38 crore unorganised workers.
- It will cover construction labourers, migrant workforce, street vendors and domestic workers, among others.
- Workers can register on the portal with the help of Aadhaar and bank account details.
- They will be issued an e-Shram card containing a 12-digit unique number.
- Registered workers will be eligible for Rs 2 Lakh on death or permanent disability and Rs 1 lakh on partial disability.
- The registration on the portal will be coordinated by the Labour Ministry, state governments, trade unions and Common Service Centres.

### **How does it help?**

- Under the Unorganised Workers' Social Security Act, 2008, a similar attempt was made. But it resulted in the registration of just 120 million workers.
- But the digitisation under this portal will now help in targeting income transfers better and in including the workers in other social security schemes.
- E.g., pension, provident fund, deposit linked insurance, maternity and accident benefits as spelt out in the Social Security Code, 2020.
- However, the Code does not spell out how this will be financed.

### **How significant is registering unorganised workers?**

- At present, unorganised workers are registered under different welfare boards, or not at all.
- In the absence of any central register, migrant workers often do not receive the benefits.
- Of the 50 million workforce of construction workers, at least 15 million are not registered.
- Of the 35 million or more registered, about 40% are not active.
- Events such as Covid-19 require reaching out to the unprotected workforce.
- Clearly, an electronic registration system that can be accessed anywhere is the need of the hour.

### **What should be done?**

- Decentralised registration process with participation of municipalities, panchayats and civil society groups.
- Flexibility to register in any centre of convenience, rather than a specified office.
- Advertising and educating the masses
- Making it easy for workers registered under other welfare boards to enlist on this portal.
- Permitting other national IDs such as voters' card for those without Aadhaar.

- Efficient data handling of more than 400 million people.

### **Crypto Banking and Decentralized Finance**

#### **What is the issue?**

The development of Bitcoin and other cryptocurrencies in a little over a decade has spawned a parallel universe of alternative financial services. Here is a look at them.

#### **What do crypto businesses offer?**

- Generally, lending and borrowing.
- Earn interest on holdings of digital currencies, often a lot more than on cash deposits in a bank.
- Borrow with crypto as collateral to back a loan. Crypto loans generally involve no credit checks as transactions are backed by digital assets.
- E.g., In a BlockFi interest account, depositors can earn a yield 100 times higher than on average bank accounts.
- [BlockFi is a secured non-bank lender that offers cryptoasset-backed loans to cryptoasset owners.]

#### **Benefits**

- Fosters financial inclusion.
- Unusually high return on their holdings for consumers.
- Provide financial stability for customers in countries with volatile government-issued currencies.

#### **Why such high yields?**

- Crypto outfits pool deposits to offer loans and give interest to depositors, just as traditional banks.
- But by law, banks are required to have minimum reserves as a safety backup.
- Unlike this, crypto banks do not have the reserve requirements; the institutions they lend to can take risky bets.
- E.g., BlockFi lends to hedge funds and other institutional investors who exploit flaws in crypto markets to make fast money without actually holding risky assets.
- Other risks: Cyberattacks, extreme market conditions, or other operational or technical difficulties that could lead to a temporary or permanent halt on withdrawals or transfers.

#### **What is a stablecoin?**

- Crypto is very volatile, making it less practical for transactions like payments or loans.
- But Stablecoins are cryptocurrencies linked to stable assets, commonly the dollar. Popular dollar-tied tokens include Tether and USD Coin.
- It aims to do in digital form what government money does.
- They provide the steady value of government-issued money in digital form for blockchain transactions, but they are issued by private entities.

## Risks

- Stablecoin issuers hold and monitor reserves, just as central bankers manage supply and demand.
- But there is no guarantee they actually hold the one-to-one dollar backing they claim.
- So, a sudden surge in withdrawals could lead to a collapse in one of those assets, putting clients and the broader economy at risk.
- Also, a central bank digital currency would render stablecoins irrelevant.

## What is a central bank digital currency?

- Central bankers are examining the potential for issuance of a government-issued cryptocurrency
- That would offer the convenience of crypto with the reliability of money controlled by a central bank.
- But governments catching up to the innovations in the market for years will be a challenge.

## What is DeFi?

- Decentralized finance, or DeFi, refers to an alternative finance ecosystem where consumers transfer, trade, borrow and lend cryptocurrency.
- Financial products become available on a public decentralized blockchain network, independently of traditional financial institutions and the regulatory structures.
- DeFi aims to –disintermediate finance, using computer code to eliminate the need for trust and middlemen from transactions.
- It's a computer-controlled market that automatically executes transactions.
- In contrast, centralized finance, or CeFi, businesses more closely resemble traditional finance, or TradFi.
- Here, consumers enter into an agreement with a company like BlockFi that collects information about them, requires them to turn over their crypto and also serves as a central point for regulators.

## What could be done in the future?

- A new regulating approach for adapting to the new technology demands.
- E.g., Requirements like code audits and risk parameters, instead of mandating that DeFi protocols maintain the reserves of a bank and collect customer information.
- Using artificial intelligence and data analysis to monitor suspicious activity and tracking identity to fight financial fraud.

## Semiconductor Chips Shortage

### What is the issue?

From delayed car deliveries to a supply shortfall in home appliances to costlier smartphones, businesses and consumers are facing the brunt of an unprecedented shortage in semiconductor chips

### Why did the chip shortage occur?

- Covid-19 pandemic and the subsequent lockdowns across the world forced shut crucial chip-making facilities
- Higher Demand for chips from laptop and electronic device-makers due to increased telecommuting and home
- Monopoly producers i.e South Korea dominate the chip-manufacturing industry
- Sanctions against Chinese tech companies
- US-China trade war
- Rollout of 5G infrastructure

- Panic buying to shore up stocks has driven up the costs of even the cheapest components of microchips
- A winter storm in Texas and a factory blaze at a Japanese fabrication unit

#### **What is its impact?**

- Triggering a structural change in the procurement policies of global manufacturers
- Long-term supply contracts are being signed by automakers
- Firms like Samsung, Tata Group are sinking huge investments into semi-conductor production
- The US, Europe and China have committed billions in subsidy to on-shoring production

#### **What option does India have?**

- Since, chip fabrication is capital-intensive (an average sized facility costs \$7-10 billion) with long gestation and rapid technology, it appears infeasible for India to strive for full self-sufficiency on chip fabrication
- But, government-owned semi-conductor facilities already operated by ISRO and DRDO can be expanded and upgraded
- Attract global consumer electronics manufacturers by showcasing the high-potential consumer electronics market and skilled talent pool in R&D
- Production-linked incentive scheme will be an apt vehicle for this

### **T+1 Settlement System**

#### **Why in news?**

**SEBI has allowed stock exchanges to start the T+1 system as an option in place of T+2**

#### **How the system works?**

- In T+1, settlement of trade takes place in one working day and the investor will get the money on the following day.
- In T+2, settlement of trade takes place in two working days. The broker who handles the trade will get the money on 2<sup>nd</sup> day, but will credit the amount in the investor's account only on 3<sup>rd</sup> day
- If a stock exchange opts for T+1 settlement cycle, it has to mandatorily continue with it for a minimum 6 months.
- Thereafter, if it intends to switch back to T+2, it can do so by giving one month's advance notice to the market

#### **What is the need for T+1 settlement system?**

- A shortened cycle reduces the settlement time
- Frees up the capital required to collateralise that risk
- Reduces the number of outstanding unsettled trades at any instant
- Narrow the time window for a counterparty insolvency/bankruptcy
- Reduces the systemic risk

#### **Why are foreign investors opposing it?**

- Operational issues due to different geographies - time zones, information flow process, and foreign exchange problems
- Difficulty to hedge the net India exposure in dollar terms at the end of the day under the T+1 system

#### **What's the global scenario?**

- The US Depository Trust & Clearing Corporation (DTCC) highlighted the immediate benefits of T+1, including cost savings, reduced market risk, etc.



- DTCC estimates that a move to T+1 could bring a 41 per cent reduction in the volatility component of National Securities Clearing Corporation's margin
- In order to move to T+1, industry participants must implement the necessary operational and business changes and regulators must be engaged

### **What's good about a 'bad bank?'**

#### **Why in news?**

The government has set up the new bad bank structure (NARCL-IDRCL) to acquire stressed assets from banks and then sell them in the market

#### **What are bad banks?**

- Technically, a bad bank is an asset reconstruction company (ARC) or an asset management company that takes over the bad loans of commercial banks, manages them and finally recovers the money over a period of time.
- The bad bank is not involved in lending and taking deposits.
- It just helps commercial banks clean up their balance sheets and resolve bad loans.
- The takeover of bad loans is normally below the book value of the loan and the bad bank tries to recover as much as possible subsequently.
- US-based Mellon Bank created the first bad bank in 1988.

#### **What is the recent new bad bank structure about?**

- India's first-ever bad bank, **National Asset Reconstruction Company Limited (NARCL)** will acquire stressed assets worth about Rs 2 lakh crore from various commercial banks
- It will pay 15% of the agreed price in cash and the remaining 85% will be in the form of Security Receipts.
- The rest will be paid when the assets are sold by IDRCL
- The other entity, **India Debt Resolution Company Ltd (IDRCL)**, will then try to sell the stressed assets in the market
- To make it work, the government has granted the use of Rs 30,600 crore to be used as a guarantee.
- If the bad bank is unable to sell the bad loan, or has to sell it at a loss, then this government guarantee of RS.30,600crore will be invoked.

#### **What is the need for bad banks?**

- According to RBI's Financial Stability Report, the gross non-performing assets (GNPA) ratio of banks may rise to **9.8 per cent** by March 2022 from the **7.48 per cent** in March 2021
- Within the bank groups, public sector banks' (PSBs') GNPA ratio is **9.54 per cent** in March 2021
- To improve the financial health of PSBs, the government was forced to recapitalise them using taxpayers' money
- So bad banks are needed to relieve the commercial banks of their stressed assets.
- It also improves the bank's position and help them resume their normal banking operations, especially lending.

## Constraints in the success of E-Shram

### What is the issue?

With the launch of E-Shram web portal, several constraints have been identified that questions the viability of the initiative

### What is the E-Shram portal?

- The portal is expected to create a **unified database for unorganised workers** to help them access various benefits of central and state government welfare schemes.
- It aims to register 38 crore unorganised workers.
- It will cover construction labourers, migrant workforce, street vendors and domestic workers, among others.
- Workers can register on the portal with the help of Aadhaar and bank account details.
- They will be issued an E-Shram card containing a 12-digit unique number.
- Registered workers will be eligible for Rs 2 Lakh on death or permanent disability and Rs 1 lakh on partial disability.
- The registration on the portal will be coordinated by the Labour Ministry, state governments, trade unions and Common Service Centres.

### What are the constraints in the success of E-Shram?

- **Long process** - The gigantic nature of registering each worker will be a long drawn process with low pace of registration in the initial stages.
- **Data security** - The absence of a national architecture relating to data security raises concerns especially when it is a mega-sized database.
- **Definitional issues** - The scheme excludes workers covered by EPF and ESI and workers aged over 59 from its ambit hurting their welfare.
- **Aadhaar-seeding** - Many workers will not have an Aadhaar-seeded mobile and Aadhaar-seeding is a controversial issue with political overtones especially in North-eastern regions.
- **Complex identities** - Unorganised may have ever-changing identities where they move between formal and informal sectors.
- **Gig workers** - Gig workers are included by the Labour ministry while they are excluded by the other three Labour Codes creating legal confusions over the classification of gig/platform workers.
- **Dependence on State governments** - In many States, the social dialogue with stakeholders such as trade unions is rather weak or non-existent.
- **Corruption** - Middle service agencies such as Internet providers might charge exorbitant charges to register and print the E-Shram cards.

### How can it be addressed?

- Involvement of surveillance agencies is crucial to address the issues of corruption.
- Government must publish statistics at the national and regional levels of the registrations to assess the registration system's efficiency.
- For efficient and leakage-less delivery ,triple linkage of One-Nation-One-Ration Card , E-Shram Card (especially bank account seeded) and the Election Commission Card can be done.
- Need for inclusion of a person from receiving social assistance and benefits for holistic success.

## Issues of Cartelisation

### What is the issue?

The Competition Commission of India has slapped a penalty of Rs.873 crore on three beer companies as well as All-India Brewers Association and 11 individuals for colluding to fix beer prices for between 2009 and 2018.

### What is a cartel?

- According to CCI, a –Cartel includes an association of producers, sellers, distributors, traders or service providers who, by agreement amongst themselves, limit, control or attempt to control the production, distribution, sale or price of, or, trade in goods or provision of servicesl.
- The International Competition Network defines a cartel as –an agreement between competitors to restrict competitionl.
- The agreement that forms a cartel need not be formal or written.
- Cartels are mostly secret conspiracies.

#### **How do cartels work?**

- According to ICN, four categories of conduct are commonly identified across jurisdictions.
  1. price-fixing
  2. output restrictions
  3. market allocation
  4. bid-rigging
- The recent issue of brewing companies is an example of price fixing where the competitors colluded together to fix the prices.

#### **How do cartels hurt?**

- Cartel raises the price above the competitive level and reduces output.
- Cartel either force some consumers out of the market by making the commodity more scarce or by earning profits that free competition would not have allowed.
- A cartel shelters its members from full exposure to market forces, reducing pressures on them to control costs.
- It undermines the overall economic efficiency and innovations.

#### **How to stop the spread of cartelization?**

- Cartels are not easy to detect and identify.
- Providing a strong deterrence to the cartels that are found guilty in the form of a monetary penalty that exceeding the amount gained by the cartel can stop its spread although it is difficult to ascertain the profits gained by them.

## **9. INFRASTRUCTURE**

### **Infrastructure push for Railways**

#### **What is the issue?**

The National Rail Plan prepared by Indian Railways along with other projects can have a transformative effect in the infrastructure of railway system.

#### **What are the recent optimisms in the railway sector?**

- Indian Railways recorded the highest ever annual freight loading of 1,233 million tonnes (mt) in 2020-21, exceeding the preceding year's 1,210 mt.
- Railway staffs have operationalised the Oxygen Expresses, delivering more than 30,000 tonnes of liquid medical oxygen amidst the pandemic.

### What is the National Rail Plan about?

- National Rail Plan (NRP) for India aims to create a ‘**future ready**’ Railway system by 2030
- Keeping the year 2050 as the horizon, NRP charts out a strategic grid for Railways to follow for the short term (up to 2024), medium term (up to 2031) and long-term.
- Intends to increase modal share of the Railways in freight to 45%.
- Reduce the transit time of freight substantially by increasing average speed of freight trains to 50Kmph.
- Identify new Dedicated Freight Corridors and new High Speed Rail Corridors.
- A cumulative outlay for the entire plan period 2021-51 is estimated at Rs.38,20,516 crore.

### Does the expectation in the document appear realistic?

- The aim to grab 45 % of the country’s freight market by 2030 (from the current 26 %) which is predicated on its carrying capacity appears unrealistic.
- NRP’s bold statement that the revenue surplus generated by the Railways would be adequate to finance future capital investment post 2030 is under question.

### How can the railways achieve the ambitious objectives set out in the NRP?

- Need to address productivity and efficiency indices in order to maximise resource utilisation and improve average system velocity.
- Need to cater to freight transport demand of other commodities (non-conventional as well as conventional high-value) through appropriate interventions for enhancing the modal share.
- A single window, end-to-end solution for logistics services as demanded by the customers.
- Partnering of Railways with logistics service providers to leverage their superior market access and flexible parcel sizes through consolidation services.

### Need For Good Urbanisation

#### What is the issue?

The Covid situation has reinforced that good urbanisation is the most powerful technology for poverty reduction.

#### What are the causes of urbanisation?

- Poor infrastructure
- Lack of productivity - 50% of our population in rural areas generate only 18% of the GDP
- Poverty
- Poor quality of education without bilingual possibilities
- Poor quality of healthcare
- Caste discrimination in villages

#### What are the issues with urbanisation?

- **Inadequate planning** – Causes congestion , pollution and aggravates the problems during disasters like flood
- **Non-scalable infrastructure** –Pressure on resources such as land, capital limits the scope of scaling the infrastructure
- **Unaffordable housing** – Leads to unhygienic living conditions and multiplication of slums
- **Poor public transport** – Tokyo has one-third of Japan’s population but planning has ensured that essential workers don’t commute more than two hours
- **Dependence of local governments** - only 13 per cent and 44 per cent of the budget of rural and urban bodies was raised themselves
- **Policy distortion** – Separate central rural and urban ministries hampers the continuity and efficiency of policies

- **Lack of power and resources** with the local governments
- **Men-only migration** - leaves women with the burden of farm work, taking care of children and elderly , having no access to health services and no emotional support from the spouse
- **Pollution** – Noise pollution and air pollution are serious issues in cities especially in Delhi
- 21 of the world's 30 cities with the worst air pollution are in India, according to 2019 World Air Quality Report
- **Water scarcity** - In four metros (Kolkata, Delhi, Chennai & Mumbai) only 30% of dirty water is treated

#### **How can a good urbanisation promoted?**

- More devolution of powers and resources by the states to the local governments is in need.
- Instead of debating on whether cities are hostile to migrants and infection hotspots they must be empowered to deliver economic justice for women, children and vulnerable.

## **10. AGRICULTURE**

### **Paddy-Wheat Monoculture in Punjab**

#### **What is the issue?**

Questions are being raised on the sustainability of paddy-wheat cultivation, especially in Punjab.

#### **What is the extent of paddy-wheat monoculture in Punjab?**

- Paddy-wheat cultivation adds up to 84.6% of the total area planted to all crops in Punjab in 2018-19.
- The real acreage share increase has taken place in paddy from below 7% in 1970-71 to almost 40% in 2018-19.
- The above gains have been at the expense of other crops such as pulses ,maize, bajra, oilseeds, cotton, groundnut ,sugarcane ,etc.
- The only crops that have registered some acreage expansions are vegetables (especially potato and pea) and fruits (kinnow).

#### **What are the problems of monoculture?**

- Increase in vulnerability to pest and disease attacks
- No nitrogen fixation unlike pulses and legumes
- Absence of crop rotation leads to depletion of soil nutrients
- Growing dependence on chemical fertilizers and pesticides
- Soil salinity and waterlogging due to excess surface irrigation
- Nutrition insecurity because of lack of crop diversification
- Decrease in biodiversity
- Economically riskier for farmers
- Decline in water table since paddy is a water-guzzling crop where more than 30 irrigations are needed (5 irrigations for wheat)
- Punjab's groundwater table has been declining by 0.5 meters per annum on an average

#### **What measures have been taken so far?**

- **Punjab Preservation of Subsoil Water Act in 2009**- bars any nursery-sowing and transplanting of paddy before May 15 and June 15, respectively
- But it pushes harvesting to October-end leaving little time for farmers contributing to stubble burning

- Minimum Support Prices (MSP) given to various crops incentivises crop diversification

#### **How can the issues of monoculture be addressed?**

- Limit Punjab's a non-basmati paddy area and ensure planting of only shorter-duration varieties
- Direct seeding of paddy can reduce the usage of inputs
- Water savings can be induced through metering of electricity
- Assured government price/per-acre incentive support must be provided for crops other than paddy and wheat
- Crop diversification, including rotation and intercropping and the use of diverse forage plants in pastureland must be promoted
- Prospective private buyers should be part of the extension effort
- But change is possible only if the State works closely with the Union Government

### **Significance of Millet Farming**

#### **Why in news?**

The United Nations General Assembly recently adopted a resolution declaring **2023 the International Year of Millets**, as proposed by India to the Food and Agriculture Organization (FAO).

#### **What are millets?**

- Millets - Sorghum, pearl millet, finger millet and several small millets (kodo, little, foxtail, proso and barnyard).
- All millets, maize, and barley together are called **coarse cereals**.
- Millets were one of the oldest foods known to humans. But they were discarded in favour of wheat and rice with urbanization and industrialization.

#### **How significant are millets?**

- Provide food, nutrition, fodder and livelihood security.
- Help mitigate the effects of climate change with low carbon footprint of 3,218-Kg equivalent of CO<sub>2</sub> per hectare. [Wheat - 3,968 kg; Rice - 3,401kg]

#### **What are the favourable factors?**

- Drought resistant
- Suitable for harsh, hot and dry environments.
- Can grow in arid regions, requiring only 350-400 mm of annual rainfall.
- Some varieties of pearl millet survive at temperatures up to 46°C.
- Require minimal inputs for growth.
- Being hardy crops, they can withstand extreme temperatures, floods and droughts.

#### **What are the concerns with millets farming?**

- Market and economic barriers.
- Low demand, especially in urban markets.
- Unjust pricing and value wringing by intermediaries.
- Low remuneration leading to farmer distress.
- Lack of input subsidies and price incentives.
- Subsidised supply of fine cereals through the PDS and change in consumer preferences leading led to a shift from the production of millets (jowar in particular) to soybean,

maize, cotton, sugarcane and sunflower.

### **What are the government's initiatives so far?**

- **Millet Mission in 2018** as part of the National Food Security Mission - Promotion of technological interventions, improvement in seed quality and MSP for bajra and jowar.
- Millet Network of India and the M.S. Swaminathan Research Foundation - Collective formation efforts to boost the domestic growth of millets.
- Setting up farmer organizations to help small and marginal farmers overcome hindrances in millet production and marketing.
- Odisha Millet Mission:
  - i. 7.2 million women emerged as 'agri-preneurs'
  - ii. about 70,000 farmers in the state took up millet farming

### **What are the other measures needed?**

#### **Market dynamics**

- Incentivizing the adoption of inter-cropping involving millets.
- Providing crop insurance and support for storage facilities.
- Broadening the millet marketing policies.
- Generation of demand for millets-based products.
  1. 2018 '#LetsMilletCampaign' in Bengaluru promoted the use of millets in dishes such as risotto and pizza by restaurateurs.
  2. Food delivery startups such as FreshMenu rolled out millet-intensive menus

#### **Cultural connection**

- Harnessing the knowledge of the value of little millets among traditional communities.
- Re-introduction of cultural associations and festivals that help promote the growth of millets. E.g.,
  1. North-East Network in Nagaland organized in 2020
  2. Mandukiya in Vishakhapatnam celebrated annually in June/July
  3. Women's collectives in Telangan promoting millets through a culture-centric approach

#### **Ecosystems and sustainability**

- The value of millets is evident in their relevance to the sustainable development goals of food security, nutrition and poverty eradication.
- In line with goals of the UN Decade of Ecosystem Restoration (2021-30), local practices can support rural economies.
  1. Drought-tolerant crops like millets with low dependence on chemical inputs.
  2. Inter-cropping of millets with other crops. [Fibrous roots of millet plants help in improving soil quality, keep water run-off in check and aid soil conservation.]

#### **Biofuel and climate resilience**

- Creating bio-ethanol using sorghum (jowar) and pearl millet (bajra), thus bringing down carbon emissions by about half.
- Millets can deliver greater returns than maize, while using 40% less energy in processing, and are cost advantageous as a feedstock for bio-ethanol production.
- All the above priorities need to be backed by government policies that promote millets production, incentivize farmers and strengthen market linkages.

### **Farmer Producer Organisation (FPO)**

#### **What is the news about?**

The government's 10,000 Farmer Producer Organisation scheme has given a major thrust to the FPO movement from corporates to public service organisations.

### What is an FPO?

- Farmers' Producer Organisation (FPO), also known as farmers' producer company (FPC), is an entity formed by primary producers including farmers, milk producers, fishermen, weavers, rural artisans, and craftsmen.
- An FPO can be a Producer Company, a Cooperative Society or any other legal form.
- FPOs are basically the hybrids of cooperatives and private companies.
- The participation, organisation and membership pattern of these companies are more or less similar to the cooperatives.
- But their day-to-day functioning and business models resemble those of the professionally-run private companies.
- The **Companies Act** was amended by incorporating Section-IX A in it to allow creation and registration of FPOs under it.

### Why are FPOs significant?

- Better income for producers
- Producers enjoy better bargaining power
- Better equipped to facilitate value-addition of the farm produce
- Doubling of export by 2022
- Facilitate small and marginal farmers with access to improved technology, credit, better input and more markets

### What are the challenges faced by FPOs?

- **Liability of newness** – New ventures have high probability to fail since they have to battle multiple problems at a time.
- **Lack of distinctiveness** - With no novelty to offer, it is often challenging for FPOs to compete in the market.
- **Audience diversity** - FPOs need to derive support from different group of stakeholders (farmer, government, buyers, NGOs etc) which is crucial to understand their expectations.
- **Lack of clarity on the market category** - FPOs may fail to meet the demand of buyers in terms of quantity requirement leading to a weak inter-organisational relationship.
- FPOs, often in a hurry, would make unrealistic promises to members to increase their membership which could lead to mismatch in expectations.
- **Multiple thresholds for success** – Measuring the success of FPOs varies according to the stakeholder
- Farmer may be look at receiving timely credit from the FPO as the vital indicator for success while corporate buyer may look upon the quality of the product.

### How can the issues be addressed?

- Collectives must do the requisite homework on issues such as modalities of the conduct of boards meetings, technical expertise for better procurement, identifying potential buyers, etc.
- Focus on multiple stakeholders including farmers, buyers and regulators can accommodate audience diversity.
- Need informational clarity regarding the process and market conditions.
- Collective effort of all stakeholders is crucial for the success of an FPO.

## The State of Agriculture in India

### What is the issue?

National Statistical Office's Situation Assessment Survey (SAS) of agricultural households for the 2018-19 agricultural year holds importance given the unprecedented crisis in India's agricultural economy.



### **What are the causes for crisis in agriculture?**

- Sharp slowdown in the economy
- Rise in input costs driven by rising wages
- Faulty implementation of India's fertilizer-subsidy reforms
- Higher fuel prices
- Back-to-back drought in 2014 and 2015
- Demonetization caused disruptions
- Covid pandemic

### **What does the SAS 2018-19 say?**

- The average income of an agricultural household from farm and non-farm incomes increased in real terms from Rs.6,436 in 2012-13 to Rs.7,683 in 2018-19.
- This was mainly due to higher wage incomes which rose 6.7% per annum.
- For a majority of the farmers engaged in crop cultivation, real incomes from it declined 1.3% per annum which led to fall in investment in productive assets.
- Net investment in productive assets in 2018-19 was less than half the level in 2012-13, even in nominal terms.

### **Why is the estimate of the SAS worrisome?**

- A large proportion of rural households in India are engaged in agriculture and within agriculture, an overwhelmingly large proportion is dependent on crop production.
- The fall in real cultivation incomes has been partly responsible for hurting demand and in turn economic growth.
- While the increase in wage labour may have protected agricultural households from a decline in real incomes, it doesn't warrant that the non-farm sector will protect farmers' incomes in the future.
- These estimates pertain to two years before the pandemic and now the situation would have worsened on account of a rise in input costs driven by energy and fertilizer prices.
- Also data from the wholesale price index suggests that farm-gate prices for a majority of crops have either declined or remained stagnant.
- Periodic Labour Force Survey showed an actual increase in workers dependent on agriculture which would cause sharp reduction in real incomes per agricultural worker.
- The agrarian issues are taking centre-stage with the intensification of the farmer agitation against three farm laws.
- The survey raises a serious concern not only on the implications of working conditions of Indian farmers but also on the sustainability of growth itself.

### **Agriculture Infrastructure Fund (AIF)**

#### **What is the issue?**

The Agriculture Infrastructure Fund scheme that aims to boost agri marketing facilities needs to be recast as the scheme remains ambiguous.

#### **What is AIF scheme?**

- It is a Central Sector Scheme approved by the Union Cabinet in 2020.
- It aims to provide a medium - long term debt financing facility for investment in viable projects for post-harvest management Infrastructure and community farming assets.
- The duration of the Scheme shall be from FY2020 to FY2032.
- Eligible beneficiaries include farmers, FPOs, PACS, Marketing Cooperative Societies, SHGs, Joint Liability Groups, Agri-entrepreneurs, Start-ups, and Central/State agency or Local Body sponsored Public-Private Partnership Projects.

- Under the scheme, Rs. 1 Lakh Crore will be provided by banks and financial institutions as loans.
- The loans are provided with interest subvention of 3% per annum and credit guarantee coverage under CGTMSE for loans up to Rs. 2 crores.

#### **What is the significance of the scheme?**

- It provides support facilities to farmers and value chain actors for risk-sharing and market access.
- Improved marketing infrastructure will help farmers sell their produce directly.
- With investments in logistics infrastructure, post-harvest losses can be reduced.
- It also provides targeting State-specific APMCs and maintenance of sanitary and phytosanitary standards for organic produce marketing and exports.
- District, state or national level monitoring committees will reduce the turnaround time for file processing to less than 60 days.
- The scheme tries to mitigate spatial and temporal risks in the agribusiness ecosystem through adequate post-harvest infrastructure facilities.

#### **Why the scheme appears ambiguous?**

- FPOs are the potential beneficiary of the scheme but their viability is a question.
- There is no reliable data about flow of funds from institutions such as NABARD, SFAC, and State agencies to FPOs in public domain.
- Lack of clarity on how the AIF will act as a market intervention scheme for market infrastructure institutions.
- There is no mechanism of convergence with existing schemes such as PEG scheme that has infused private or corporate capital into agribusiness.
- Expanding the scope of APMCs by integrating them into eNAM structure may not prevent farmers from distress sales or market failures until a monitoring and evaluation cell is put in place.
- There is a need for modification of AIF funds linked to agricultural commodity derivative markets for improved market integration and reliable price discovery as like China's **'futures plus'** scheme.

### **Punjab's case of desertification**

#### **What is the issue?**

Series of reports on water table depletion predicted that Punjab will turn into a desert in 25 years.

#### **What were the reports?**

- The Punjab Vidhan Sabha committee has said that the state will turn into a desert in the next 25 years if the present trend of drawing water from underground aquifers continues.
- The State of the World Report, 1998 published by Washington-based World Watch Institute (WWI) said that Punjab's aquifers could be depleted by 2025.

#### **What were the reasons cited for desertification?**

- Drawing more water than is being replenished
- Use of tubewell or submersible pumps for extraction of groundwater
- faulty cropping pattern such as predominant cultivation of water guzzling paddy especially with the advent of Green Revolution
- The rate of water extraction in Punjab is 1.66 times against the rate of replenishment.
- Puddling (tillage of paddy field in a flooded condition) has created a thick hard layer on the agricultural fields, disturbing the recharging system and creating flash floods.

#### **How to explain the two 25-year predictions?**

- Out of 138 blocks in Punjab, 109 have already gone into the **'dark'** or over-exploited zone, which means groundwater extraction is more than 100 per cent here.
- Paddy takes at least 4,000 liters water to grow one kg of rice, estimating that the remaining half of Punjab will also slip into the dark zone in the coming 25 to 27 years.

- Already upper aquifers have been dried and this could happen to deep aquifers too, and then Punjab will be like another Rajasthan.
- Farmers must be incentivised to choose cropping patterns that require less water, and go for drip irrigation or other water management mechanisms.

## **11. SCIENCE & TECHNOLOGY**

### **DNA Fingerprinting : Concerns in conviction of criminals**

#### **What is the issue?**

Though DNA fingerprinting technology has helped in solving many crimes, its efficiency is being suspected in the conviction of criminals

#### **What is DNA fingerprinting?**

- It is a technique for identification of an individual by examining their DNA
- DNA or Deoxyribo Nucleic Acid is composed of bases, (adenine (A), cytosine (C), guanine (G), and thymine (T)), sugar and phosphate
- Two bases link to each other using hydrogen bonds to form basepairs
- Though 99.7% of the makeup is similar between any two people there is a 0.3% difference which accounts to almost 10 million different base pairs
- By examining this we can identify the relation between two people
- Blood, semen, hair and teeth (with roots), bones, flesh, saliva etc. can be used to study the DNA

#### **What are its uses?**

- For criminal identification
- To resolve disputes of maternity /paternity
- To identify mutilated remains
- In cases of exchange of babies in hospital wards,
- In forensic wildlife
- Close to 60 countries have got the legislations on DNA profiling

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#### **What are the issues with DNA fingerprinting?**

- **Ecological impacts** - Degradation of a sample with prolonged contact to sunlight, humidity, and heat
- **Unreliable results** - Instrumental errors also lead to unreliable results
- **Privacy issues** - Sensitive genetic information of a person is exposed to another individual and it is against human rights
- **Security concerns** - DNA databases holding DNA profiles
- **Lack of expertise** - Leads to mishandling of samples
- **Intermixing of samples** - Corruption, tampering with evidence, misconception during labeling sample is possible
- **Targeting of groups** - If people from one ethnic group are more often convicted, they will be overrepresented and leads to targeting

#### **How to address these issues?**

- Acceptance by the legal fraternity and ensuring 100% conviction rate

- Legal framework for innocents is needed to allude the fears of DNA profiling in data collection and maintenance
- Stringent implementation of Human DNA Profiling Bill
- Experts have clarified that DNA profiling will not give out any details of background or identity of religion

## Space Junk

### Why in news?

In March, a Chinese military satellite, Yunhai 1-02 collided with a piece of junk leftover from a 1996 Russian rocket launch leaving a trail of debris high above the Earth

### What causes space junk?

- Unoperational / Expired / Exploded satellites, rocket parts or spacecrafts
- Anti-satellite tests that incapacitates or destroys *satellites* for strategic or tactical purposes (like **Mission Shakti** conducted by DRDO, China's 2007 ASAT test, etc.)
- Rare collision between two spacecrafts
- Mega-constellations of satellites planned by companies such as SpaceX's **Starlink project**

### What are the threats posed by space junk?

- Collision of space debris with other satellites or amongst themselves produces more fragments and exacerbates the problem
- A belt of space junk would make certain low-Earth orbits unusable
- Experts have warned of **Kessler syndrome**
- Astronauts in space would be harmed by space debris
- Old batteries from defunct spacecrafts can explode and leaks may occur in the system
- The International Space Station (ISS) is constantly at risk from space debris

### What has been done so far to manage the space junk?

- Orbital Debris Program Office was set up by NASA which issued the world's first set of debris-mitigation guidelines in 1995.
- it proposed that satellites be designed to re-enter Earth's atmosphere within 25 years of mission completion
- Europe plans ClearSpace-1, Earth's first space debris removal mission in 2025
- Researchers from Purdue University are test-launching a first-of-its-kind Spinnaker3 drag sail to low-earth orbit, in an effort to clean up space debris
- Japanese startup Astroscale launched a satellite that retrieves used satellites and other space junk
- In August 2020, **NETRA Project** was initiated by **ISRO** which is an early warning system to protect the satellites from space debris and other hazards of Space
- International Space Law points that if a satellite becomes dysfunctional, then the satellite should deorbit and its re-entry into the earth should be carried

### What should be done?

- Updation of the **1967 Outer Space Treaty** which grants countries permanent property rights to their objects in space complicating the efforts to clean up debris
- Funding research into debris-removal technologies and partnerships with companies by NASA

- Expansion of Artemis Accords, a framework for space cooperation that includes (so far) 11 other countries by US

### Hybrid Cloud and the Remote Reality

#### Why in news ?

As businesses shift priorities to enable remote work, it's time to rely on an effective multi-cloud, multi-edge, hybrid approach

#### What is a hybrid cloud?

- Hybrid cloud is an IT infrastructure that combines and unifies public cloud and private cloud services from multiple cloud vendors.
- Hybrid cloud architecture focuses on the mechanics of transforming portions of a company's on-premises data centre into private cloud infrastructure
- It then connects that infrastructure to public cloud environments hosted off-premises by a public cloud providers such as Google Cloud Services, IBM Cloud, Microsoft Azure, etc.

#### What are the benefits of hybrid cloud platform?

- **High scalability** - With the scope of new additions in existing infrastructure
- **Very secure** - Giving businesses crucial control over their data and improved security
- **High flexibility** - Certain types of data can be stored on-premise while allowing less sensitive data to be stored on the cloud
- Greater infrastructure efficiency by strengthening remote work
- Cost and time efficient
- Modernisation of application landscape
- Seamless cross-functional communication
- Overall business acceleration

#### What parameters need to be assessed in this model?

- Regulatory requirements
- Security compliance
- Stringent latency
- Connectivity issues
- Dependency on internal IT infrastructure
- Managing multiple vendors and platforms

## 12. ENVIRONMENT

### India & Net Zero

#### What is the issue?

India is yet to declare its net-zero targets.

#### What is net-zero?

- It is also referred to as carbon-neutrality.
- It does not mean that a country would bring down its emissions to zero.
- Rather, net-zero is a state in which a country's emissions are compensated by absorption and removal of greenhouse gases from the atmosphere.

- It is achieved by creating more carbon sinks such as forests, while removal of gases from the atmosphere requires futuristic technologies such as carbon capture and storage.
- It is even possible for a country to have negative emissions, if the absorption and removal exceed the actual emissions.
- IPCC report finds that if the world reaches net-zero emissions by 2040, the chance of limiting warming to 1.5°C is considerably higher.

#### **What is the status of the rest of the world?**

- 50% of the global economy is already committed to net zero emissions by 2050.
- China is committing to be so before 2060.
- It is not only governments but the businesses are increasing climate action too to take advantage of the new opportunities arising.
- Investors injected over \$500 billion into climate transition in 2020.

#### **Why India has not committed yet?**

- **Environmental justice** - India is not committing to net zero on the basis that it needs to see significant support from developed countries.
- India demands long promised environment reparation (\$100 billion) from developed nations for adaptation strategies of emerging economies to achieve their net zero target by 2030.
- **CoP targets** - It states that the net-zero goal does not figure in the 2015 Paris Agreement, which only requires every signatory to take the best climate action it can.
- It argues that instead of opening up a parallel discussion on net-zero targets outside of the Paris Agreement framework, countries must focus on delivering on what they have already promised.
- India is set to significantly exceed its Paris Agreement commitment of reducing the emissions intensity of its GDP by 33-35% below 2005 levels by 2030.

#### **Why is this tactic dangerous?**

- India has a national interest in global and national climate action as it is among the most vulnerable countries to climate change
- Therefore it should be among the more active against the threats.
- As a rising power, India must involve in climate action to seek stronger influence globally.
- India is already the 3<sup>rd</sup> largest emitter in the world
- With US, China, and the EU being signed up to net zero, it will become a significant drag on India's international diplomacy not to sign up.
- There is no longer a trade-off between reducing emissions and economic growth.
- e.g U.K. has reduced emissions over 40% and grown its economy over 70% since 1990.
- Solar energy costs have fallen 90% in recent years, providing the cheapest electricity in India.
- Given the negative impacts, addressing climate is now central to economic development, not an added luxury to consider.
- E.g Agricultural policy that does not consider adaptive approaches in the face of increased flooding & drought is irresponsible.

#### **Is net zero the one-stop solution?**

- Global warming is just one input in the carrying capacity of the Earth.
- So Net Zero should not treat as a form of 'cognitive bargain' to reverse climate change.

- There is a lengthy road beyond Net Zero to achieve a carbon negative environment.

## **Hydrogen Fuel Economy - Green Hydrogen**

### **Why in news?**

Indian Prime Minister recently announced the National Hydrogen Mission.

### **What is the National Hydrogen Mission?**

- Budget 2021 found mention of Hydrogen Energy Mission in 2021-22 for generating Hydrogen from green power sources.
- Accordingly, the Ministry of New and Renewable Energy (MNRE) has drafted a National Hydrogen Energy Mission.
- It aims to scale up Green Hydrogen production and utilization across multiple sectors.

### **How is the current hydrogen production?**

- Hydrogen is emerging as an important source of energy since it has zero carbon content and is a non-polluting source of energy.
- But the current global production of hydrogen of about 80 million metric tonnes, is almost wholly produced **through fossil fuels**.
- It uses 6% of global natural gas and 2% of coal, and contributes 830 million tonnes of CO<sub>2</sub>.

### **What is green hydrogen?**

- Green hydrogen is produced by splitting water into hydrogen and oxygen using an electrolyzer powered by electricity from green energy sources such as wind and solar.
- When burnt, it gives out water vapour, with no residue or climate-harming impact.
- Green hydrogen is aided by:
  1. Global energy transition toward renewables
  2. Declining costs
  3. Breakthroughs in technology - electrolyzer capacity projects
  4. High carbon taxes

### **What are the challenges?**

- A lot of energy for the electrolysis of water is needed.
- Unless this electricity is produced with a zero-carbon footprint, it defeats the key aspect of 'green' hydrogen.

**What are the advantages?**

- Transform India from an energy-deficient to an energy-rich country.
- Make India a net exporter of energy.
- Play a key role in decarbonization efforts.
- Significantly reduce import dependence– India spends \$160 billion on imports of crude oil, liquified natural gas, coal and fertilizer.
- Solar-to-hydrogen also solves an intermittence problem, as hydrogen substitutes the need for battery storage.

**Favourable factor**

- All-year sunshine - Most parts of India receive 4-7 kilowatt-hour of solar energy/sq. m/day.

**What are the possible applications?**

- Transportation, including trucks, buses, cars and rail.
- Feedstock for fertilizers, chemicals and refineries.
- Decarbonizing buildings and decarbonizing high-heat industries such as steel-making.
- Hydrogen fuel cells – A key complement to batteries.
- Grid-scale storage solutions and feedstock for ammonia production (thus eliminating the need for natural gas).
- Blending hydrogen with natural gas in city gas pipelines reduces the import of natural gas.

**What are the interventions so far?**

- The cost of green hydrogen made by electrolysis is estimated to be around Rs.350 per kg. The Centre plans to bring it down to Rs.160 per kg by 2029-30.
- Plans for green hydrogen consumption obligation (GHCO) in fertilizer production and petroleum refining; similar to renewable purchase obligations (RPO).
- The draft Electricity Rules, 2021 have allowed green hydrogen purchase to help meet RPOs.
- Plans to call bids for 4 GW electrolyzer capacity.
- Extending the PLI (Production Linked Incentive) scheme for manufacturing electrolyzers.
- NTPC Renewable Energy is setting up India's largest solar park of 4.75 GW in Gujarat, with plans to make green hydrogen on a commercial scale.
- NTPC has also called bids for setting up a pilot project for mixing green hydrogen with natural gas for the city gas distribution network.
- Besides, Reliance Industries Ltd has recently announced plans to build large-scale, low-cost and high-efficiency electrolyzers as part of its \$10 billion renewables push.

**What lies ahead?**

- An enabling policy framework.
- A nudge to increase demand for green hydrogen.
- Infrastructure development, such as of pipeline networks and last-mile connectivity.
- Facilitating private capital to participate in the scaling-up effort.

**13. INTERNAL SECURITY****Karbi Anglong Agreement****Why in news?**

Karbi Anglong peace deal was recently signed

**What has been the history?**



- Naga insurgency has been an inspiration for separatist movements in the North-Eastern region to protect their culture.
- Bodoland movement and the ULFA movement aimed for a sovereign Assam.
- But many smaller groups have also fought to protect their distinct ethnic, linguistic and cultural identity from being subsumed within a broader Assamese identity.
- KarbiAnglong, is the largest district in Assam and comprises various tribal and ethnic groups including the Kukis, Dimasas, Garos, RengmaNagas, Tiwas and Karbis,
- Karbis were the majority among them and demanded a separate state of KarbiAnglong and North Cachar Hills.
- But on the negative side they exploit alienation caused by an insensitive and exploitative state, and engage in extortion, ethnic violence, killings, etc.

#### **What has been the approach of Centre?**

- The Centre offered autonomy under the Constitution on the one hand while using security forces to crush militancy on the other.
- Insurgents who negotiate for peace are accommodated in state legislatures or Autonomous Councils.
- This approach has had various degrees of success, in Mizoram, Tripura, theBodo areas.
- However, KarbiAnglong separatists rejected Sixth Schedule status.
- They demanded for an autonomous state under Article 244(a) of the Constitution.

#### **What is KarbiAnglong Agreement?**

- It is tripartite agreement signed between the Centre, five insurgent groups active in KarbiAnglong, and the Assam government.
- It marks the culmination of an extended process of negotiation to end insurgency in the region.
- It will ensure greater devolution of autonomy to the KarbiAnglong Autonomous Council (KAAC).
- It proposed to notify Karbi as the official language of KAAC.
- English, Hindi & Assamese will continue to be used for official purposes.
- A Special Development Package of Rs. 1000 crores over 5 years will be given by the Union and Assam for the focussed development of KAAC areas.
- It also provides for rehabilitation of cadres of the Karbi armed groups, who have agreed to renounce violence.
- Assam Government shall set up a Karbi Welfare Council for focussed development of Karbi people living outside KAAC area.
- The Consolidated Fund of the State will be augmented to supplement the resources of KAAC.
- Over a thousand armed insurgents have surrendered their arms.

#### **Does the agreement satisfy the local demands?**

- The current KarbiAnglong agreement signed falls short of fulfilling the demand for autonomous.
- Yet it promises more autonomy than currently enjoyed by the Autonomous Council under the Sixth Schedule.
- 10 seats on KAAC has been marked for people from any community, paving the way for other community representation.
- Autonomy and funds alone may not be sufficient to improve the condition of the people.

- Autonomous Councils are often captured by vested interests, who invoke fears of a militant past.
- The enhanced development funds are often diverted to private parties.

### **Land Ports - Border Trade**

#### **What is the issue?**

Safe and secure border is sine qua non for enhanced trade and integration. Here is how land ports have contributed to this.

#### **What is a Land port?**

- The regional economy of South Asian countries sharing land borders is heavily fragmented by trade and transportation barriers.
- Addressing this, in 2012, India set up the Land Ports Authority of India (LPAI) through the LPAI Act, 2010, under the Ministry of Home Affairs.
- Land port is an area on the international borders including portions of national, State highways and other roads, and railways.
- It is notified as land Customs station or immigration check-post under the Customs Act, 1962 or the Foreigners' Act, 1946.

#### **What are the contributions so far?**

- The LPAI has developed till date a total of 9 ICPs (Integrated Check Posts), which are located across India's international land border.
- These are:
  1. Attari - Handling India's trade with Pakistan
  2. Agartala, Petrapole, Srimantapur and Sutarkandi - All handling India's trade with Bangladesh
  3. Raxaul and Jogbani - Both handling India's trade with Nepal
  4. Moreh - Handling India's trade with Myanmar
- Several new ICPs are coming up and their total number is likely to touch 24 by 2030.
- India's border management ecosystem with land ports is very much in sync with the obligations of the WTO Trade Facilitation Agreement.

#### **What is the role of a LPAI?**

- Manages the ICP properties.
- Develops, sanitizes and manages the facilities for cross-border movement of passengers and goods at designated points.
- Puts in place systems, which address security imperatives at the ICPs.
- Wide range of security equipment - Handheld metal detectors, door frame metal detectors, barriers and rotary mirrors which discourage manual frisking and verification by security forces.

#### **How have land ports helped?**

- Trade and infrastructure have a self-reinforcing relationship.
  1. With ICPs in place, India's trade with her immediate neighbours (BBMNP countries) has gone up from 48% in 2012-13 to 63.59% in 2020-21.
  2. In value terms - Rs. 327 billion in 2012-13 to Rs. 954.89 billion.
  3. The output shift - Rs. 6.55 crore per vehicle in 2012-13 to Rs. 257 crore per vehicle in 2020-21
- Creating a seamless passenger experience by facilitating cross-border passenger movement of over 1.26 crore people.
- Channelising informal trade to formal trade - Potential for replication in several African land ports experiencing large informal trading activities.

#### **What are the unfinished tasks?**

- Enhancing and upgrading cross-border trade infrastructure at land borders:
  1. Access and Surveillance Control Systems
  2. Full Body Truck Scanners for non-intrusive scanning and Radiation Detection Equipment at ICPs which shall considerably reduce dwell time at ports.
- Once some of India's connectivity corridors such as the Trilateral Highway become operational, ICPs (particularly in eastern neighbourhood) require further capacity expansion.

### **Tackling the Maoists**

#### **Why in news?**

According to the data provided by Ministry of Home Affairs, the geographical influence of Maoists has contracted from 96 districts in 10 States to 41 districts in 2010.

#### **How has the CPI (M) evolved?**

- The People's War Group and the Maoist Communist Centre of India merged into the CPI (Maoist) in 2004.
- It managed to consolidate its presence across – Red Corridor spanning across the central and north-central India, marked by rural deprivation.
- The CPI (Maoist) has sought to project itself as a revolutionary political movement that sought to rebuild after the failures of the earlier Naxalite movement.
- Rather than focussing on socio-economic struggles, Maoists relied on waging a military battle against the state to capture power resulting in militarisation of these areas.
- It led to repression of tribal people both by state actions such as creation of Salwa Judum (disbanded by judicial order) and Maoist authoritarianism.

#### **How Red Corridor region is classified?**

- The Red Corridor area is the area under the influence of Left Wing Extremists (LWE) or Maoists.
- It is spread across 10 states — Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Telangana, Uttar Pradesh, West Bengal and some northern fringes of Tamil Nadu
- These Maoist-affected areas were first classified in 2006.
- The districts were assessed on parameters like –
  1. Violence profile,
  2. The kind of logistical and other support provided to maoist cadres

#### **What are the governments' measures?**

- The governments of the states deployed additional resources and are trying their best to check Maoists' expansion.
- A number of awareness campaigns were organised in remote areas which are most vulnerable to Maoist influence.
- Arrangements for villagers' training were made and government employment for hundreds was facilitated.
- Financial aid of around Rs.30 crore annually is given to the districts for various developmental works.
- Road Connectivity Project for Left Wing Extremism (LWE) Affected Areas has been undertaken by the government.
- After the killing of 25 CRPF personnel in Sukuma district of Chhattisgarh in 2017, **-SAMADHAN doctrine** has been formulated to counter naxalism.
- Fortified Police Station Scheme was launched by the central government in 10 States to enhance the security of police personnels.
- Under the Special Infrastructure Scheme, around 120 crores was given to strengthen the special forces.
- The Home Ministry has provided support to security forces for other facilities such as Helicopters, UAVs etc.
- The Maoist insurgency still has potency in South Bastar in Chhattisgarh, Andhra-Odisha border and in some districts in Jharkhand.

### What are the effects of Left wing extremism (LWE)?

- Frequent skirmishes have affected the security forces.
- It has left many tribal civilians caught in the crossfire.
- Human rights' violations were reported in naxal prone areas.
- It has added to the alienation among the poor in these areas.
- It also has its effect on the government exchequer.
- LWE widened the backwardness in terms of social and economic development.
- It affected the democratic setup by hindering the elections.

### How can the issue be tackled?

- Empowerment of tribal people and civil society activists to promote peace in these areas.
- Expansion of welfare and rights paradigms to limit the movement.
- Surrendered LWE cadre should be used for intelligence collection to the maximum possible.
- The trade in minor forest produce needs a closer look in Maoist-affected areas to break the contractor-Maoist nexus.
- Hence, the country's best weapon against ultras is extending the welfare state to areas it hasn't quite reached.

## PRELIM BITS

### 14. HISTORY, ART & CULTURE

#### ***Battle of Saragarhi***

*September 12, 2021 marks the 124<sup>th</sup> anniversary of the Battle of Saragarhi that has inspired a host of armies, books and films, both at home and abroad.*

- **Saragarhi** was the communication tower between Fort Lockhart and Fort Gulistan in the North West Frontier Province (NWFP).
- Two forts, now in Pakistan, were built by Maharaja Ranjit Singh but renamed by the British.
- **Battle of Saragarhi was a last-stand battle** fought between the British Raj and Afghan tribesmen (Afridi and Orakzai) in 1897.
- During the Battle, 21 soldiers of 36<sup>th</sup> Sikhs (now 4 Sikh), led by Havildar Ishar Singh, along with a non-combatant called Daad were pitted against over 8,000 tribals but they managed to hold the fort for 7 hours.
- Queen Victoria awarded to these 21 soldiers the Indian Order of Merit posthumously along with 2 \_marabas' (50 acres) and Rs 500 each.

#### ***Porunai/Thamirabarani River Civilisation***

*Tamil Nadu Chief Minister announced that the Thamirabarani civilisation dates back to 3,200 years (1155 BC).*

- This age was determined using carbon dating analysis of rice with soil found in a burial urn at Sivakalai, Thoothukudi district, Tamil Nadu.
- Tamil Nadu Chief Minister said archaeological excavations would be carried out in other States and countries in search of Tamil roots.
- Tamil Nadu Archaeology Department would conduct research at Quseir al-Qadim and Pernica Anekke (Egypt) as well as in Khor Rori (Oman), to establish the **Tamils' trade relations** with these countries.
- Already, potsherds bearing Tamil scripts have been found in these countries.
- Studies would also be conducted in Southeast Asian countries, such as Indonesia, Thailand, Malaysia and Vietnam, where **King Rajendra Chola** had established supremacy.

### Thamirabarani River

The literary community has hailed the Tamil Nadu government for calling the Thamirabarani River by its historical name 'Porunai'.

- **About Thamirabarani** - Thamirabarani River is the only major perennial river in Tamil Nadu.
- It is the state's shortest river that originates from the Agastyarkoodam peak of Pothigai hills of the Western Ghats, Tamil Nadu.
- It empties into the sea at the Gulf of Mannar after passing through Tirunelveli and Thoothukudi districts.
- **Naming** - Thamirabarani River was historically called Porunai, Than Porunai, Porunai and Poruntham in Tamil literature - from the Sangam era to Nayakar era (6th century BCE to 17th century CE).
- [Amaravathi River flowing in Chera region has been called AanPorunai and ThanAanPorunai.]
- Both Than Porunai and AanPorunai find a place in Tholkappiam, an ancient treatise on Tamil grammar.

Other Names of Thamirabarani	Mentioned in the Tamil Literature
Than Porunai	Purananuru
Porunai	KambaRamayanam
'Than Poruntham' in a song about 'a very cold river'	PeriyaPuranam

- The word 'Than Porunai' evolved into 'TamiraPorunai' before becoming 'Thamirabarani'.
- Porunai is a non-Sanskritised word and the right pure Tamil word, which should replace the word 'Thamirabarani'.

### Gupta Period Inscriptions

Archaeological Survey of India discovered remains of an ancient temple dating back to the Gupta period in a village in Uttar Pradesh's Etah district.

- **Findings** - The Bilsarh site was declared 'protected' in 1928.
- Every year, the ASI undertakes scrubbing work at the protected sites. This year, the team has discovered,
  1. Two decorative pillars close to one another, with human figurines,
  2. 'Shankhalipi' inscriptions in the stairs of the temple saying, 'Sri Mahendraditya', the title of Kumaragupta I of the Gupta dynasty.
- The stairs led to a structural temple built during the Gupta period.
- **Significance** - The discovery becomes significant since only 2 other structural temples from the Gupta age have been found so far,
  1. Dashavatara Temple (Deogarh) and
  2. Bhitargaon Temple (Kanpur Dehat).
- The Guptas were the first to build structural temples, distinctly different from the ancient rock-cut temples.

### Shankhalipi Script

- Shankhalipi or 'shell-script' is a term used to describe **ornate spiral characters** assumed to be Brahmi derivatives that look like conch shells or shankhas.
- They are found on temple pillars, columns and rock surfaces across north-central India and they date to between the 4th and 8th centuries.
- Both Shankhalipi and Brahmi are stylised scripts used primarily for names and signatures.
- The inscriptions consist of a small number of characters, suggesting that the shell inscriptions are names or auspicious symbols or a combination of the two.
- **Chronology** - The script was discovered in 1836 on a brass trident in Uttarakhand's Barahat by James Prinsep, who was the founding editor of the Journal of the Asiatic Society of Bengal.

- Prominent sites with shell inscriptions include the
  - a. Nagarjuna group of caves in the Barabar Hills near Gaya,
  - b. Mundeshwari Temple in Bihar,
  - c. Udayagiri Caves in Madhya Pradesh,
  - d. Mansar in Maharashtra.
- Shell inscriptions are also reported in Indonesia's Java and Borneo.
- **Meaning** - These shell scripts are not yet deciphered. But there are a sufficient number of shell characters to represent the syllables of the Sanskrit language.

## 15. GEOGRAPHY

### **24% Rain Shortfall**

*According to IMD, India ended August with a 24% shortfall from the predicted amount of rainfall.*

- August normally receives the 2<sup>nd</sup> highest rainfall in the four monsoon months.
- So even a substantial rainfall in September would not wipe out the deficit.
- This brings India's overall monsoon rainfall deficit to 9%, meaning –below normal rainfall.
- In June, the IMD forecast rainfall in northwest, south, east and central India would be –normal or within an 8% error window of their historical average.
- This forecast too has been significantly off the mark, with Northwest India and Central India registering a 14% shortfall.

### **Reasons for August monsoon failure**

- The key reason has been an extended break in rainfall from August 8-18.
- Wind-bearing depressions in the Bay of Bengal, coupled with moisture from the Arabian Sea, usually inject surges of rain over central India.
- But this did not happen increasing the break-like conditions.
- Effects of global warming were also impacting monsoon rainfall.
- The number of rain-bearing depressions in the Bay of Bengal was declining and pre-monsoon cyclones, such as Tauktae possibly altered heat distribution patterns over the landmass.
- They influenced moisture distribution and thereby causing erratic rainfall.

### **Future of El Niño and La Niña**

*A study simulated the El Niño-Southern Oscillation (ENSO) using South Korea's supercomputer Aleph.*

- The study completed a series of century-long Climate model simulations covering present-day climate and 2 different global warming levels.
- It notes that the intensity of the ENSO temperature cycle can weaken as carbon dioxide increases.

- It found that increasing atmospheric CO<sub>2</sub> can cause a weakening of future simulated ENSO sea surface temperature variability.
- It found that the sea-surface temperature deviates from normal level at CO<sub>2</sub>-doubling (2×CO<sub>2</sub>) conditions and became robust at CO<sub>2</sub> quadrupling (4×CO<sub>2</sub>).
- Reasons for the collapse :- **Movement of atmospheric heat** was studied to decode the collapse of the ENSO system.
  1. The future El Niño events will lose heat to the atmosphere more quickly due to the evaporation of water vapour.
  2. There will be a reduced temperature difference between the eastern and western tropical Pacific, inhibiting the development of temperature extremes during the ENSO cycle.
- There can be a weakening of the **tropical instability waves** of the equatorial Pacific in the projected future, which can cause a disruption of the La Niña event.
- There is a **tug-of-war** between positive and negative feedback in the ENSO system, which tips over to the negative side in a warmer climate.
- This means future El Niño and La Niña events cannot develop their full amplitude anymore.

### ***La Palma Island***

*There was volcanic eruption in the La Palma Island of the Canaries archipelago.*

- La Palma Island of Spain is the most north-western island in the Canary Islands. It was formed as a result of a volcanic formation.
- **Geographical features** - La Caldera de Taburiente is a large volcanic caldera (10 km in diameter). It was established as a national park named Taburiente National Park.
- Roque de los Muchachos (Highest Mountain in the island) houses the GRANTECAN (Gran Telescopio Canarias) astronomical observatory.
- Its well-watered slopes are densely wooded and deeply dissected by ravines.
- **Economy** of La Palma revolves around irrigation-based farming.
- Bananas, tomatoes, and tobacco, along with embroidery, are exported from the port of Santa Cruz de la Palma - the island's capital.
- Tourism also has importance.

## **16. POLITY**

### ***Deputy Speaker***

*Delhi High Court has asked the central government to explain its stand on a petition that claims vacancy of Deputy Speaker's post is a violation of the constitution.*

- Petitioner pointed out that position had been vacant for the last 830 days and the office is a constitutional mandated and not a ceremonial one.
- **Article 93** of the constitution provides for the election of both the Speaker and the Deputy Speaker.
- Deputy Speaker is elected by the Lok Sabha from amongst its members.
- The date of election of the Deputy Speaker is fixed by the Speaker. (For Speaker's election, the date of election is fixed by the President.)
- He/She remains in the office during the life of Lok Sabha.
- He/She assumes the power of speaker when the office is vacant or speaker is absent.



- When he/she appointed as a member of the parliamentary committee, he/she automatically becomes its chairman.
- He/She can vote at the first instance.
- But when acts as the Speaker, he/she have the privilege of the Casting vote in case of tie.
- Deputy Speaker gives the resignation letter to the Speaker and can be removed in the same manner as Speaker.
- Upon the vacancy of the office, election should be held as soon as possible.

### ***Supreme Court's Stance on Presumption of Innocence***

*The Supreme Court has now ruled that there shall be no presumption of innocence once a person is convicted by a learned trial court.*

- The SC has also asked the High Courts to be 'very slow in granting bail to the accused pending appeal who are convicted' of the serious offences like murder.
- **Basic elements** - The court said that every judgment should contain 4 basic elements,
  1. Statement of material (relevant) facts,
  2. Legal issues or questions,
  3. Deliberation to reach a decision and
  4. Ratio or conclusive decision.
- A judgment should be coherent, systematic and logically organised. It should enable the reader to trace the fact to a logical conclusion on the basis of legal principles.

### ***Supreme Court's Ruling on Insolvency Resolution Plan***

*The Supreme Court has ruled that an Insolvency Resolution Plan of the companies, once approved by the Committee of Creditors (CoC), cannot be modified or withdrawn.*

- The SC has also categorically said that the only process of withdrawal from IBC is by following the procedure detailed in Section 12A.
- [Section 12A says that the corporate debtor must get approval of more than 90% of creditors to take the company out of the resolution plan.]
- Also, National Company Law Appellate Tribunal (NCLAT) said that the National Company Law Tribunal (NCLT) does not have the jurisdiction to permit withdrawal after the plan had been approved by the CoC.
- Further, NCLAT also said that the financial wisdom of the CoC was final.
- It further held that since Section 32A of [Insolvency and Bankruptcy Code](#) (IBC) grants full immunity to the resolution applicant from any offences of the corporate debtor, the companies had no grounds to withdraw.

### ***Citizen Arrestor***

- It is a form of the vigilante in the United States, which is supported by a law that makes vigilantism respectable.
- A 'citizen arrester' enjoys **legal status** and whose actions are protected by a law that permits him or her to pursue and arrest a person accused of breaking the law.
- Because of its potential for abuse in the US, there is a debate on the need to circumscribe the scope, and eligibility, of who can be a citizen arrester.
- The concept of 'citizen arrester' draws on a legal convention that comes from the Common Law tradition in England (dating from 12th Century.)



## 17. GOVERNMENT INITIATIVES

### ***Pradhan Mantri Gramin Digital Saksharta Abhiyan***

*PMGDISHA drive has been launched by the Ministry of Electronics & Information Technology (MietY) under the PMGDISHA scheme.*

- Launched in 2017, the PMGDISHA scheme is the Government's flagship **Digital Literacy scheme for rural areas**.
- It envisages to make 6 crore persons in rural areas, across States/UTs, digitally literate.
- This will reach to around 40% of rural households by covering one member from every household where there is no digitally literate person.
- **Entry criteria** - Beneficiary should be Digitally Illiterate, who is only from rural areas of the country.
- All such households where none of the family member is digitally literate will be considered as eligible household under the Scheme.
- Only one person per eligible household would be considered for training
- Age Group - 14 to 60 years
- **Priority would be given to**
  - Non-smartphone users, Antyodaya households, college drop-outs, Participants of the adult literacy mission.
  - Digitally illiterate school students from class 9th to 12th, provided facility of Computer/ICT Training is not available in their schools.
- **Preference** would be given to SC, ST, BPL, women, differently-abled persons and minorities.
- Identification of beneficiaries would be carried out by CSC-SPV in collaboration with Gram Panchayats, District e-Governance Society (DeGS), and Block Development Officers.
- **Implementation** of the Scheme would be carried out under the supervision of MietY in active collaboration with States/UTs through their designated State Implementing Agencies, DeGS, etc.
- **Training** will be given in the nearest Training Centre or CSCs for 20 hours which has to be completed in a minimum of 10 days and maximum of 30 days.

### ***National Oil Spill Disaster Contingency Plan (NOS-DCP)***

- This Plan was issued by the Ministry of Defense in 1996.
- It has designated Indian Coast Guard as the Central Coordinating Authority for combating marine oil spills in Indian waters and undertaking oil spill prevention and control.
- However, the NOS-DCP comes under the purview of the National Disaster Management Authority, Ministry of Home Affairs.
- It mandates the Coast Guard to coordinate with state departments, ministries, port authorities and environmental agencies to assist in oil spill cleaning operations.
- In 2015, the Coast Guard revised the NOS-DCP to meet international standards, setting up an Online Oil Spill Advisory system, etc

### ***Eklavya Model Residential School (EMRS)***

- They were started by the Ministry of Tribal Affairs (MoTA) in 1997-98 to impart quality education to Scheduled Tribes (STs) children in remote areas.
- The schools focus not only on academic education but on the all-round development of the students.

- This will enable the children to avail of opportunities in high and professional educational courses and get employment in various sectors.
- Each school will cater to 480 students from Class VI to XII.
- National Education Society for Tribal Students (NESTS), an autonomous organization has been set up under the MoTA to establish and manage these Schools across the country.
- Eklavya schools will be on par with NavodayaVidyalaya and will have special facilities for preserving local art and culture besides providing training in sports and skill development.
- **Funding** - Grants were given for construction of schools and recurring expenses to the State Governments under Grants under Article 275 (1) of the Constitution.
- **Target** - As per EMRS Guidelines of 2010, at least one EMRS is to be set up in each Integrated Tribal Development Agency (ITDA) / Integrated Tribal Development Project (ITDP) having 50% ST population.
- By 2022, every block with more than 50% ST population and at least 20,000 tribal persons will have an EMRS.

### ***SPIN Scheme***

*Khadi and Village Industries Commission (KVIC) launched the Strengthening the Potential of India (SPIN) Scheme and set up a pottery cluster under [SFURTI Scheme](#) in Varanasi to empower the marginalized potters.*

- SPIN Scheme is a specially-designed no-subsidy program that enables to make potters self-sustainable.
- It enables the registered potters to get easy direct loans from the banks under Pradhan MantriShishu Mudra Yojana.
- Under the SPIN Scheme, KVIC is acting as a facilitator for financial aid to potters through RBL bank and also providing training to the artisans.
- There will be no financial burden on the exchequer and the loan will be repaid by the potter in easy instalments.

### ***Relief Package for Telecom Sector***

*Union Cabinet has approved 9 structural reforms for telecom sector to provide relief to cash-strapped companies.*

- A **4-year moratorium** has been approved on
  1. Dues of Telecom Service Providers (TSPs) arising out of the Supreme Court judgment on annual gross revenue (AGR), and
  2. Due payments of spectrum purchased in past auctions.
- Currently, TSPs pay around 3-5% of AGR as SUC, while they pay around 8% of the AGR as licence fee.
- AGR are the revenues, considered for payment of statutory dues.
- **Definition of AGR** has been changed to exclude non-telecom revenue.
- Monthly compounding of interest on spectrum usage charges will be replaced by annual compounding and the interest rate will come down, based on the formula MCLR + 2%.
- **100% foreign direct investment (FDI)** in the telecom sector through the automatic route is also announced.
  - So far, up to 49% was allowed through the automatic route and anything thereafter had to go through the government route.
- The package is also expected to boost 4G proliferation, infuse liquidity and create an enabling environment for investment in 5G networks.

### **FDI Routes**

- **Automatic Route** - Foreign entity does not require prior approval of the government or the RBI.
- **Government Route** - Foreign entity is mandated to get the prior government approval.
- It must apply for approval through Foreign Investment Facilitation Portal. This application is forwarded to respective ministry or dept.
- The respective ministry or department approves or rejects the application in consultation with the DPIIT.

### ***Vehicle Scrappage Policy***

*The Delhi Transport Department has iterated that not all provisions of the Centre's vehicle scrapping policy will be applicable in Delhi-NCR.*

- **Centre's scrapping policy** – It classifies vehicles as commercial and personal and not based on their fuel type.
- Commercial vehicles over 15 years old and personal vehicles over 20 years old will have to scrapped only if they fail an automated fitness test.
- It states that old vehicles clearing an automated fitness test are allowed to ply.
- **Delhi Transport Department Policy** - It classifies vehicles based on type of fuel.
- It states diesel vehicles over 10 years old and petrol vehicles more than 15 years old –shall not ply on the roads of Delhi-NCR.
- Those violate are liable to face penal action under Motor Vehicles Act, 1988.
- It clarified that though Registration Certificates are valid, renewal will not be allowed in Delhi-NCR once diesel vehicle crosses 10 years.
- But, no-objection certificates will be issued to diesel vehicles aged between 10-15 years old for re-registration in certain states.

### **Shoonya Campaign**

*With Rocky Mountain Institute (RMI) and RMI India's support, NITI Aayog has launched Shoonya Campaign.*

- The Shoonya campaign aims to
  1. Accelerate adoption of **electric vehicles** (EVs) in the urban deliveries segment and
  2. Create consumer awareness about the health, environmental and economic benefits of **zero-pollution delivery**.
    - As part of the campaign, a corporate branding & certification programme is being launched to promote industry's efforts towards transitioning to EVs for final-mile deliveries.
    - An **online tracking platform** will share the campaign's impact through data such as vehicle kilometers electrified, carbon savings, criteria pollutant savings and other benefits from clean delivery vehicles.

## **18. BILATERAL RELATIONS**

### **China in CPTPP**

*China has applied for joining the Comprehensive and Progressive Trans Pacific Partnership (CPTPP).*

- CPTPP is a free trade agreement (FTA) between 11 Asia-Pacific countries.
- It is a separate treaty that incorporates the provisions of the Trans-Pacific Partnership (TPP) Agreement (signed in 2016 but not yet in force), with the exception of a limited set of suspended provisions.
- Also known as TPP-11, the CPTPP agreement has been functional since December 30, 2018.
- **Origin** - CPTPP began as the TPP led by the US under Barack Obama's administration. But, Donald Trump withdrew from the TPP in 2017.
- **Members** - Japan, Canada, Australia, Singapore, Malaysia, Mexico, Peru, Chile, New Zealand, Brunei and Vietnam.
- All the members of the must be members of the Asia-Pacific Economic Cooperation (APEC).
- **China in CPTPP** - As an APEC member, China is justified in wishing to join a deal comprising 11 other APEC members.
- Technically, there can't be any opposition to China's joining the deal if it is willing to accept the terms and conditions for becoming a member.
- The decision on request from China or any other country would be determined by the conviction of CPTPP members in the applying member's ability to uphold existing rules of the FTA.

### **UAE's Green Visa**

*The United Arab Emirates has announced a new class of visas called "green visa" intended to ease the restrictions faced by foreigners in pursuing employment opportunities in the country.*

- The green visa will allow foreigners to work in the UAE without being sponsored by an employer.
- This will be a marked change from the norm that requires a prospective worker to be sponsored via an employer, who, in turn, applies for a work permit from the Ministry of Human Resources and Emiratization.
- The green visa will enable visa holders to sponsor their parents. It will increase the cap on the age of children who can be sponsored by the holder from 18 to 25.

- It will allow the holder to stay in the country up to 3 months to look for a new job if they are fired from older one. Previously, it was only 30 days.
- This visa targets -highly skilled individuals, investors, business people, entrepreneurs, as well exceptional students and postgraduatesl.

### ***China-Myanmar New Passage***

*China opens its 1<sup>st</sup> sea-road-rail transport link to Indian Ocean, called the China-Myanmar New Passage.*

- It is a transport corridor that connects the logistics lines of Singapore, Myanmar and China.
- This route, which is the 1<sup>st</sup> to link western China with the Indian Ocean, is a **sea-road-rail link**.
- This passage is currently the most convenient land and sea channel linking the Indian Ocean with southwest China.
- The railway line of the route currently ends in Lincang on the Chinese side opposite the Myanmar border trade town of Chin Shwe Haw.

### ***China's New Maritime Rules***

*China's New Maritime Rules are likely to escalate the existing tension with the US and its neighbouring countries in the region.*

- It is designed to control the entry of foreign vessels in China's disputed territorial waters covering South China Sea, East China Sea and Taiwan Strait.
- Both military and commercial foreign vessels will be required to report their detailed information upon their visits to these regions.
- It covers submersibles, nuclear vessels and ships carrying radioactive materials, bulk oil, chemicals, liquefied gas and other toxic harmful substances.
- The range of information to be provided varies based on the kind of vessels.
  1. The vessels viewed as endangering China's maritime traffic safety should report their name, call sign, current position, next port of call and estimated time of arrival.
  2. The name of shipborne dangerous goods and cargo deadweight will also be required.
- This is seen as violating the United Nations Convention on the Law of the Sea (UNCLOS) guidelines.

### ***Durand Line***

*The fence erected by Pakistan along the 2,640-km Durand Line which is opposed by Taliban is a potential flashpoint in relations between the Taliban and Pakistan*

- In 19<sup>th</sup> century Afghanistan was used as a buffer by the British against the fear of Russian expansionism to its east.
- Hence the British civil servant Sir Henry Mortimer Durand signed an agreement with Afghan ruler Amir Abdur Rahman on November 12, 1893 demarcating the Durand line.
- The line stretches from the border with China to Afghanistan's border with Iran.
- This line demarcated the limits of Afghanistan's and British India's —spheres of influence| on the Afghan —frontier| with India.
- The line puts the strategic Khyber Pass on the British side.
- It cuts through Pashtun tribal areas, leaving villages, families, and land divided between the two spheres of influence.
- Some historians believe it was a part of British's divide and rule policy.
- Hence, Pashtuns rejected the line after independence.

- When the Taliban seized power in Kabul the first time, they also rejected the Durand Line.
- The cross-border tensions peaked in 2017 with several attacks on Pakistani border posts by militants.
- Pakistan accused Afghanistan of sheltering – while the Afghan government accused Pakistan of giving safe haven to Afghan Taliban and Haqqani Network.
- So Pakistan began erecting a \$500mn fence fitted with surveillance cameras and infrared detectors, and punctuated by 1,000 watchtowers along the Durand Line.
- Cross-border movement will only be allowed through 16 formally designated points after the completion of the project.
- The fence has been a source of more tensions and seen as a move by Pakistan to formalise the boundary, making their division permanent.
- But Pakistan believes that the fence will help control any spill over from unrest and chaos there.

## 19. ECONOMY

### Capital Expenditure

*The Union Steel Minister chaired a meeting to review the progress of capital expenditure (CapEx) by Steel CPSEs.*

- The Union government defines CapEx as the money spent by the government on,
  1. Acquisition, upgradation and maintenance of fixed physical assets like land, buildings, health facilities, education, technology, etc and
  2. Investment in shares that gives profits or dividend in future.
- Making capital expenditures on fixed assets can include repairing a roof, purchasing a piece of equipment, or building a new factory.
- As repayment of loan reduces liability, it is also capital expenditure.

Capital Expenditure	Revenue Expenditure
Capital expenditure is the expenditure by the government for the development of fixed assets.	Revenue Expenditure is the expenditure by the government which does not impact its assets or liabilities.
Along with the creation of assets, it also includes repayment of loan.	It includes salaries, interest payments, pension, and administrative expenses.
If an item has a useful life of more than one year, it is be capitalized (i.e., can be considered CapEx).	If an item has a useful life of less than one year, it shouldn't be capitalized (i.e., cannot be considered CapEx).
It is a payment for goods or services recorded - or capitalized - on the balance sheet.	It must be expensed on the income statement instead on the balance sheet.

### Government Borrowings for FY 2021

*The government will borrow Rs. 5.03 lakh crore in the 2<sup>nd</sup> half of the fiscal year 2021-22 to fund the revenue gap for reviving the pandemic-hit economy.*

- According to the Budget for 2021-22, the government's gross borrowing was estimated at Rs. 12.05 lakh crore, while net borrowing was pegged at Rs. 9.37 lakh crore in the FY 2021-2022.
- Out of gross market borrowing of Rs. 12.05 lakh crore projected in the Budget, the government planned to borrow,

- a. Rs. 7.24 lakh crore in first half (H1) of FY 2021,
- b. Rs. 5.03 lakh crore in second half (H2) of FY 2021.
- But the effective borrowing in H1 was Rs 7.02 lakh crore.
- H2 projection also factors requirements for release of balance amount of the GST compensation to the states during the year.
- The Budget has pegged fiscal deficit at 6.8% for the next fiscal, down from 9.5% of the GDP in the current financial year.
- [Fiscal deficit is the gap between what the central government spends and earns. It is the level of borrowings by the Union government.]

### **Government Borrowings**

- Government Borrowing is a loan taken by the government through issue of government securities called G-secs and Treasury Bills.
- It is the total amount of money that the government borrows to fund its spending on public services and benefits.
- It falls under capital receipts in the Budget document.
- The government raises money from the market to fund its fiscal deficit.
- If the government borrows more than what it has projected in the Budget document, its interest costs go up risking higher fiscal deficit.

### **Off-budget Borrowings**

- Such borrowings are a way for the Centre to finance its expenditures while keeping the debt off the books - so that it is not counted in the calculation of fiscal deficit.
- The Off-budget Borrowings include,
  1. Loans that public sector undertakings were supposed to take on their behalf and
  2. Deferred payments of bills and loans by the Centre.
- These items constitute the off-budget borrowings because these loans and deferred payments are not part of the fiscal deficit calculation.

### **Safe Harbour**

*The Central Board of Direct Taxes has extended the applicability of the Safe Harbour Rates further for 2020-21 for calculating transfer pricing by foreign firms in India.*

- Safe harbour is defined as circumstances in which the tax authority shall accept the transfer price declared by the taxpayer to be at arm's length.
- Generally, a safe harbour is a legal provision to sidestep or eliminate legal or regulatory liability in certain situations, provided that certain conditions are met.
- The phrase safe harbour also has uses in the finance, real estate, and legal industries.
- The term safe harbour may also be used to refer to a "shark repellent" tactic used by companies who want to avert a hostile takeover.
  - The company may purposefully acquire a heavily-regulated company to make themselves look less attractive to the entity that is considering taking them over.
- Safe harbor can also refer to an accounting method that avoids legal or tax regulations.

### **Animal Spirits**

*The government has given an urgent call to action for reviving the animal spirits in the economy.*

- ‘Animal spirits’ is a term coined by the British economist, J. M. Keynes.
- This term refers to the ways that **human emotions and instincts can drive financial decision-making** of investors and consumers in times of economic stress or uncertain environments and volatile times.
- Animal spirits are used to help explain why people behave irrationally, and are the forerunner to modern behavioral economics.
- If spirits are low, confidence levels will be low. This will drive down a promising market - even if the economy fundamentals are strong.
- If spirits are high, confidence among participants in the economy will be high, and market prices will soar.

### **Customs Notified Airport**

*The Central Board of Indirect Taxes and Customs (CBIC) has declared Kushinagar Airport as a Customs notified airport.*

- This declaration would facilitate international passenger movements including that of Buddhist pilgrims.
- A customs airport is an airport notified by the appropriate customs authority of the country as an airport shall be airports for
  1. The unloading of imported goods and
  2. The loading of export goods or any class of such goods.

### **India's 1<sup>st</sup> Euro Green Bond**

*Power Finance Corporation Ltd (PFC), the leading NBFC in power sector, has issued its maiden Euro 300 million 7-year Euro Bond.*

- It is the first ever Euro denominated Green bond issuance from India.
- Moreover, it is the first ever Euro issuance by an Indian NBFC and the first Euro bond issuance from India since 2017.

### **Investing in Equity Market**

*On a day when the Sensex and Nifty closed at fresh highs, the SEBI chairman cautioned investors against market risks and called for due diligence before investing.*

- The investors in securities market should be consciously aware of the fact that such **investments are subject to market risks**.
- There is a big surge in retail participation in equity markets.
- Investors should not only go for fundamentally strong and better run companies. But they should also follow the basics of investment like,
  - a. Asset allocation (Investors should not get tempted and divert funds from other assets like FDs, debt MFs, PF, gold etc into equities),
  - b. Due diligence (i.e., basic check on the company) before investing in primary and secondary markets,
  - c. Avoiding leveraged investment and going for professional advice.

### **Vaccine Passport**

- It is a certification of the Covid-19 health status of a citizen, approved by inter-governmental bodies, which can be carried physically or digitally.
- Covid-19 vaccine passports refer to a person's vaccination status, recent infection record or a recent RT-PCR test result that shows no infection.
- A version of the certification adopted by International Air Transport Association is being rolled out by all major international carriers.



- **Beneficiaries** - Countries whose economies rely on tourism can look forward to improved tourist flow if there can be international standards evolved on vaccine passports.
- Such certification can help people moving across international borders.
- It can be a ticket to attend indoor events or restaurants in countries with high vaccination rates, to promote mobility within their economies.
- Even in regional/domestic economies, non-travel related activities which rely on physical presence can restart, with such passports.
- **WHO's Stand** - The WHO had said that proof of vaccination not be required for movement.
- But on presenting such proof, nations could relax measures relating to testing and quarantine for such travellers.
- This can benefit travellers who are fully vaccinated 2 weeks prior by 'approved vaccines'.

## 20. AGRICULTURE

### **Minimum Support Price for Rabi Crops**

*Cabinet Committee on Economic Affairs (CCEA) has approved the increase in the Minimum Support Prices (MSP) for all designated Rabi crops for Rabi Marketing Season (RMS) 2022-23, when in advance of the sowing season.*

- Normally MSP for Rabi season was announced in October. But this announcement has been advanced to September since last year.
- MSP approved for designated Rabi Crops for 2022-23 during RMS is higher or equal to 1.5 times of cost of production.

### **Minimum Support Price**

- MSP is an integral component of Agriculture Price Policy and it targets to ensure support price to farmers and affordable prices to the consumer.
- The Government of India declares MSP for agricultural crops such as Cereal, Pulses, Oilseeds and commercial crops every year at the beginning of the sowing season based on the,
  1. Views of State Governments and Central Ministries/ Departments concerned,
  2. Recommendations of the Commission for Agricultural Costs and Prices (CACP).
- Factors considered by CACP for fixing MSP include
  1. Cost of production,
  2. Domestic and international prices,
  3. Demand-supply conditions,
  4. Inter-crop price parity,
  5. Terms of trade between agricultural and non-agricultural sectors.
- **Crops** - MSP is announced for Kharif crops - Paddy, Jowar, Bajra, Ragi, Maize, Tur, /Arhar, Moong, Urad, Cotton, Groundnut, Sunflower Seed, Soyabean (yellow), Sesamum, nigerseed and cotton.
- MSP is announced for Rabi crops - Wheat, Barley, Gram, Masur, Rapeseeds & Mustard, Safflower and Toria.
- MSP is also announced for 2 other commercial crops - Copra and De-husked Coconut, and Jute.
  - MSPs of toria and de-husked coconut are fixed on the basis of the MSPs of rapeseed/mustard and copra, respectively.

### **Procurement of Agriculture Produce**

- In recent years, there is a manifold increase in the procurement of agriculture produce of designated crops on MSP by the Government of India in collaboration with the State Governments.

- Procurement of wheat and Paddy at MSP comes under Schemes implemented by Dept. of Food & Public Distribution (DFPD) through centralized and de-centralized procurement mechanism.
  - The procured Wheat and Paddy is utilized in distribution under Targeted Public Distribution System (TPDS) and other welfare schemes under National Food Security Act (NFSA).
- Procurement of pulses and oilseeds is made at MSP as per the Schemes under PM-AASHA scheme of DA&FW.
- Procurement of Notified Pulses is done under Price support Scheme (PSS) by the Central Nodal Agencies through State designated Agencies during harvesting season.
- Since 2015, the procurement of Pulses is also done at MSP to maintain the National Buffer stock of Pulses under Price Stabilization Fund (PSF).
- Procurement of Coarse grains is done as per the existing DFPD scheme.
- Procurement of Cotton is done at MSP by the Cotton Corporation of India under the Scheme implemented by Ministry of Textiles.
- Procurement of Copra is done under PSS of the PM-AASHA in Copra producing States based on the receipt of the proposal.

#### **Commission for Agricultural Costs and Prices (CACP)**

- It is an attached office of the Ministry of Agriculture and Farmers Welfare.
- It is an advisory body that came into existence in 1965 whose recommendations are not binding on the Government.
- Aside from fixing MSP, CACP also fixes Fair Remunerative Prices (FRP) for Sugarcane.

#### ***MSP for Oilseeds***

*The Union government announced very high Minimum Support Price (MSP) for rabi crops such as oilseeds and pulses to boost their production.*

- **Reasons** - The 50% rise in price of edible oils is mainly due to labour shortages and crop failures in major edible oil-producing nations - Indonesia, Malaysia, Argentina, etc.
- So, the government increased MSP for oilseeds to,
  1. Cut down India's dependence on foreign oil imports by boosting domestic production, and
  2. Protect Indian consumers from price shocks due to global factors.
- **Benefits** - The greater percentage increase in the support prices for oil seeds when compared to that of other crops could increase the amount of land and other resources used to cultivate oil seeds.
- But it is unlikely to offer immediate benefits in terms of higher domestic production of oil seeds and lower edible oil prices for consumers.
- If these measures can help improve oilseed supply in the long run, they can indeed benefit consumers.

#### ***Simplification of Coffee Act***

*Ministry of Commerce & Industry decided to simplify the Coffee Act, 1942.*

- The Coffee Act enacted in 1942 has some regulatory issues.
- **Registration** - Any person owning land with coffee plants planted on it, or divided amongst different estates has to apply for registration at the registration officer appointed by State Government.
- They have to do so within a month of the date when they became owner.

- Once registered, it can only become invalid if the registering officer cancels it.
- Punishment for non-compliance to above mentioned procedure is a fine of up to Rs. 1000 and a fine of up to Rs. 500 for each subsequent month.
- **Coffee Board of India** is a statutory organization constituted under the Coffee Act, 1942.
- It functions under the Ministry of Commerce & Industry.
- **Selling** - All saleable coffee has to have been cured at licensed curing establishment or delivered to the buyer through a curing establishment licensed under the Act.
- It can also be sold in accordance to a license procured from the Coffee Board. Owners can also sell uncured coffee.
- Every establishment made with the purpose of curing coffee must get a license from the Board for the same.
- The Act states that Coffee cannot be exported from India by anyone except the Board or with the authorization of the Board.

## 21. ENVIRONMENT

### *Heterosis*

- A vast majority of commercially grown crops are hybrids, where two inbred lines are crossed, with their first-generation hybrid offspring exhibiting a vigour that is lacking in either of its parents.
- This property of hybrid vigour exhibited by the hybrid crop plants is known as heterosis.
- A recent study has found that there is a strong positive relationship between the heterosis of a hybrid plant and the soil microbes.
- In laboratory-sterilised soils that are totally devoid of microbes, both the inbred parents and hybrid offspring grow equally well i.e. no heterosis.
- When the soil environment was 'rebuild' using bacteria, there was an increase in heterosis.
- Fumigating, or steaming the soil in one experimental plot led to decreased heterosis, because this soil was depleted of microbes.

### *WHO's Global Air Quality Guidelines 2021*

*Global Air Quality Guidelines (AQGs) 2021 released by the World Health Organization (WHO) would make India appear worse than it already looked under the existing 2005 norms.*

- WHO's new Global AQGs are an evidence-based and practical tool for improving the quality of the air on which all life depends.
- AQGs recommend air quality levels for 6 pollutants - Particulate Matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>) sulphur dioxide (SO<sub>2</sub>) and carbon monoxide (CO).
- It also highlights good practices for the management of certain PM types (black/elemental carbon, ultrafine particles, particles from sand & dust storms).
- This is applicable to both outdoor and indoor environments globally.

***Climate Action & Finance Mobilization Dialogue***

*India and the USA launched the “Climate Action and Finance Mobilization Dialogue (CAFMD)”.*

- CAFMD was launched under India-US Climate and Clean Energy Agenda 2030 Partnership launched at the Leaders' Summit on Climate.
- It aims to advance inclusive and resilient economic development.

**India-US Climate & Clean Energy Agenda 2030 Partnership**

- It is a joint climate and clean energy initiative by India with the US.
- It will demonstrate how the world can align towards swift climate action with inclusive & resilient economic development by taking into account the national circumstances as well as sustainable development priorities.
- The objectives of the initiative are,
  1. To mobilize investments and speed clean energy deployment,
  2. To demonstrate & scale clean technologies needed to decarbonize sectors including industry, transportation, power, and buildings,

3. Build capacity to measure, manage, and adapt to the risks of climate-related impacts,
  4. Enabling green collaborations in India in order to create templates of sustainable development for other developing countries.
- The Partnership will proceed along two main tracks:
    1. Strategic Clean Energy Partnership and
    2. Climate Action and Finance Mobilization Dialogue.

### **Tarballs**

*Tarballs have resurfaced on Mumbai's beaches like Cuffe Parade shoreline and Juhu beach and Versova beaches.*

- Tarballs are dark-coloured, sticky black oil-emanating balls lying on the shore.
- **Formation** - Tarballs form when crude oil floats on the ocean surface. They are formed by weathering of crude oil in marine environments.
- They are transported from the open sea to the shores by sea currents and waves.
- Tarballs are usually coin-sized and are found strewn on the beaches. But, over the years, they have become as big as basketballs.
- They stick to the cleaning machinery and are very difficult to wash off. They give off a foul fuel smell.
- **Deposition** - All the oil spilt in the Arabian Sea gets deposited on the western coast in the form of tarballs in the monsoon season when wind speed and circulation pattern favour transportation of these tarballs.
- Tarballs are removed from the beaches post-high tide.

### **Netherlands' Nitrogen Crisis**

*The Netherlands has proposed a plan to slash livestock numbers by 30% by forcing farmers to sell their emission rights and even their land to the state.*

- The Netherlands has been battling a –nitrogen crisis‖ caused by excess nitrogen emissions in the vulnerable natural areas.
- The concern with livestock is that livestock production leads to alarming nitrate pollution of groundwater.
- **Impacts** -The livestock produce manure which, when mixed with urine, releases ammonia (a nitrogen compound).
- This ammonia, via farm runoff, can get into water bodies, in which case the excessive nitrogen will damage sensitive natural habitats.
- Nitrogen can lead to algae that deplete oxygen at the surface of the water.
- Nitrogen in the soil, which is largely attributable to livestock production, leaches to groundwater mainly in the form of nitrate (NO<sub>3</sub><sup>-</sup>)
- Run-off and leaching of nutrients from soils and groundwater leads to eutrophication as a result of which nitrogen concentrations exceeds the standard level.
- Moreover, deposition of nitrogen compounds can also affect terrestrial ecosystems through acidification and eutrophication.

### **Impacts of Thawing Permafrost**

*The latest IPCC report has warned that increasing global warming will result in reductions in Arctic permafrost.*

- Permafrost thawing will very rapidly impact the countries where **roads/ buildings were constructed on permafrost.**

- E.g.: Russian railways, roads in northwest Canada, etc
- If thawing begins, the **organic material** that is now entombed and frozen in the ground will become available for microbiota to break down.
- In some environments, the biota will **release carbon dioxide**, and in others **release methane** which is about 25 to 30 times more potent as a greenhouse gas than carbon dioxide.
  1. Total quantity of carbon buried in permafrost is about 1500 billion tonnes and the top 3 meters of the ground has 1000 billion tonnes.
  2. Currently, the world emits into the atmosphere approximately 10 billion tonnes of carbon a year.
  3. So, if the permafrost thaws and releases even only 1% of the frozen carbon in any one year, it can nullify anything that we do about industrial emissions.
- **New diseases** - It is not sure whether thawing permafrost can release new bacteria or viruses, or even cause another pandemic.
- When the permafrost was formed thousands of years ago, there weren't many humans who lived in that region which was necessarily very cold.
- The environment now is so much more suitable than during the Ice Age for not just human life, but also for microbes.

### ***Low-Carbon Bricks***

*Researchers have developed energy-efficient low-carbon bricks using construction and demolition waste (CDW) and alkali-activated binders.*

- These low-carbon bricks were developed from CDW waste through an alkali activation process using fly ash and ground slag.
- Low-carbon bricks do not require high-temperature firing, and avoid the use of high-energy materials such as Portland cement.
- The technology will be a solution to,
  1. Disposal problems associated with C&D waste mitigation,
  2. Conservation of mined raw material resources,
  3. Reduction of emission.

### ***Hybodont Shark***

*Teeth of new species of hybodont shark of Jurassic age called Strophodusjaisalmerensis have been reported for the first time from Jaisalmer region of Rajasthan by the Geological Survey of India (GSI).*

- Hybodonts sharks were a dominant group of fishes in both marine and fluvial environments during the Triassic and early Jurassic time.
- But, these sharks started to decline in marine environments from the Middle Jurassic onwards until they formed a relatively minor component of open-marine shark assemblages.
- Hybodonts finally became extinct at the end of the Cretaceous time 65 million years ago.
- The newly discovered crushing teeth from Jaisalmer represent a new species named by the research team as Strophodusjaisalmerensis.
- The genus Strophodus has been identified for the first time from the Indian subcontinent.

### ***Vishnuonyx***

Recently, the fossil of *Vishnuonyxneptuni* (Neptune's Vishnu) species was found in the Hammerschmiede area, a fossil site in Bavaria, Germany.

- Between 12.5 and 14 million years ago, the members of the *Vishnuonyx* genus of otters lived in the major rivers of southern Asia.
- Fossils of these now extinct otters were first discovered in sediments found in the foothills of the Himalayas.
- This is the first discovery of any member of the *Vishnuonyx* genus in Europe; it is also its most northern and western record till date.
- **Vishnuonyx** were mid-sized predators that weighed 10-15 kg.
- They depended on water and could not travel long distances over land.
- Its travels over 6,000 km to Europe were probably made possible by the geography of 12 million years ago, when the Alps were recently formed.
- These Alps and the Iranian Elbrus Mountains were separated by an ocean basin, which would have made it easier for the otters to cross it.

## SPECIES IN NEWS

### Sea Cucumber

Indian Coast Guard team at Mandapam, Tamilnadu seized two tonnes of sea cucumber, a banned marine species.

- Sea cucumber is primarily smuggled from Tamil Nadu to Sri Lanka in fishing vessels.
- In 2020, the world's first conservation area for endangered sea cucumbers was set up in Lakshadweep Islands.

Agency or Act	Conservation Status
IUCN Red List	Endangered
CITES	Appendix II and III
Wildlife Protection Act, 1972	Schedule I

- **Threats** - Illegal overfishing and smuggling for food & traditional medicine and human population density.
- Sea cucumbers are in high demand in China and Southeast Asia.
- **Geographic hotspots** for conservation action include east Africa, the Coral Triangle in the southwest Pacific and Central-Western Pacific.

### Humboldt Penguin

Mumbai's Byculla Zoo announced the addition of two new Humboldt penguin chicks.

- Humboldt penguin (*Spheniscushumboldti*) is a medium-sized species that belongs to a genus that is commonly known as the 'banded' group.
- It has an average height of over 2 ft.
  - Emperor penguin, the largest of penguin species, stands at over 4 ft tall, while the little penguin has a maximum height of 1 ft.
- Humboldt penguins are endemic to the Pacific coasts of Chile and Peru.
- They are so named because their habitat is located near the Humboldt Current, a large oceanic upwelling characterised by cold waters.
- Humboldt Penguins burrow and create nesting sites in guano (fecal) deposits.
- Their breeding season in the wild is either March-April or September-October depending on the location of the colony.
- They have large, bare skin patches around their eyes, an adaptation to help keep them cool.

- **Threats** - Habitat destruction, overfishing of their prey species, drowning in gill nets, guano harvesting, ecological disasters like oil spills, pollution like trash in the ocean, human interference & El Niño Southern Oscillation events.

Agency	Conservation Status
IUCN Red List	Vulnerable
CITES	Appendix I (Endangered)

### ***Manda Buffalo***

*National Bureau of Animal Genetic Resources (NBAGR) has recognised the Manda buffalo as the 19th indigenous and unique buffalo breed of India.*

- Manda buffaloes are found in the Eastern Ghats and plateau of Koraput region of Odisha.
- They are resistant to parasitic infections, less prone to diseases and can live, produce and reproduce at low or nil input system.
- They give birth to a calf every 1.5 to 2 years for the whole life of 20 years, after they get matured at around 3 years.
- **Uses** - These buffaloes contribute to the nutrition of households. Average milk yield is 2 to 2.5 litre in single milking with 8% fat.
- They assist in all the agricultural operations in the undulated hilly terrain for generations.
- With Manda buffalo recognised by NBAGR, both Centre and State governments must devise a strategy for conservation of these buffaloes.
- Besides, research would be carried out to enhance buffaloes' productivity through breeding strategy.

### **National Bureau of Animal Genetic Resources**

- Affiliated to Indian Council of Agriculture Research (ICAR), NBAGR is the nodal agency for the registration of newly identified germplasm of **livestock and poultry** of the country.
- Mandate - Identification, Evaluation, Characterization, Conservation and sustainable Utilization of Livestock and Poultry Genetic Resources.

### ***Black Tigers***

*A study on black tigers of Simlipal Tiger Reserve showed that a mutation in TransmembraneAminopeptidase Q (Taqppep) gene caused black stripes to broaden or spread into the orange-brown coloured background.*

- Simlipal's small and isolated tiger population led to inbreeding and the anomalous appearance characterised by wide, merged stripes.
- **Pseudo-melanism** is a rare stripe pattern variant of tigers, which is distinguished by stripes that are broadened and fused together.
- This condition is observed in both wild and captive tigers.
- Pseudo-melanism is different from true melanism, a condition characterised by unusually high deposition of melanin, a dark pigment.
- **Rare** - Mutants are genetic variations which may occur spontaneously, but not frequently, in nature.
- Black tigers were sought out as a novelty by trophy hunters for their unusual appearance. So, only a few survived to establish blood lines.
- Besides, pseudo-melanism is caused by a recessive (hidden) gene. But these genes are rare and it is unlikely that two unrelated tigers will carry the same one and pass it on together to a cub.



- In an ideal tiger world, where far-ranging individuals are never short of choices for partners, that makes succession of black tigers a rarity.
- **Success rate** - Under exceptional circumstances, a black tiger may succeed as part of a very small (up to 5 individuals) founding population that is forced to inbreed in isolation for generations.
- This will offer the recessive gene frequent chances to show up.
- **Natural selection** is also favouring melanistic leopards as their darker coats confer a selective advantage in both hunting and avoiding hunters in Simlipal's tropical moist deciduous and semi-evergreen forest.

#### Other Records

- Pseudo-melanistic tigers are also present in three zoos in India where they were born in captivity.
  1. Nandankanan Biological Park (Bhubaneswar),
  2. Arignar Anna Zoological Park (Chennai) and
  3. Bhagwan Birsa Biological Park (Ranchi)
- All of them have ancestral links to one individual from Simlipal.

## 22. SCIENCE AND TECHNOLOGY

### SPACE

#### *Mangalyaan Mission*

*India's Mars Orbiter spacecraft has completed seven years in its orbit, well beyond its designed mission life of six months.*

- Also known as Mangalyaan, Mars Orbiter Mission (MOM) is the maiden interplanetary mission of the Indian Space Research Organisation (ISRO).
- Launched in 2013, the probe was successfully inserted into Martian orbit on September 24, 2014.
- The spacecraft has already covered 3 Martian years (1 Martian year = 2 Earth years or 687 days).
- **Launch** - PSLV-C25, the 25<sup>th</sup> flight of PSLV launched MOM Spacecraft.
- PSLV was used to launch MOM as GSLV was not in operational condition then. So, ISRO could apportion only about 15 kg for scientific instruments.

- **Purpose** - MOM is primarily a technology demonstration venture and all the mission objectives were successfully met.
- MOM will explore and observe Mars surface features, morphology, mineralogy and the Martian atmosphere.
- Further, a specific search for methane in the Martian atmosphere will provide information about the possibility or the past existence of life on the planet.

Scientific Instruments	Purpose
Mars Exospheric Neutral Composition Analyzer (MENCA)	To study neutral gas atoms in the Martian atmosphere
Lyman Alpha Photometer (LAP)	To quantify hydrogen & deuterium
Thermal Infrared Imaging spectrometer (TIS)	To study mineral resources of Mars
Methane Sensor for Mars (MSM)	To search for methane
Mars Color Camera (MCC)	To capture the images of the Martian Surface

### ***Samples from Moon by Chang'e-5***

*In 2020, China's Chang'e-5 lunar mission delivered to Earth nearly 2 kg of rocky fragments and dust from the Moon.*

- As Chang'e-5 landed on the 'far side' area of the Moon, which was not sampled before, it retrieved fragments of the youngest lunar rocks ever brought back for analysis in laboratories on Earth.
- **Findings** - The 90% of the materials collected by Chang'e-5 likely derive from the landing site and its immediate surroundings.
- These volcanic rock materials are of 'mare basalts' type.
- These rocks are visible to us as the darker grey areas that spilled over much of the nearside of the Moon as ancient eruptions of lava.
- But, 10% percent of the fragments have distinctly different, 'exotic' chemical compositions.
- **Significance** - The distinct 10% fragments may preserve records of other parts of the lunar surface as well as hints of the types of space rocks that impacted the Moon's surface.
- The samples had beads of rapidly cooled glassy material, which came from extinct volcanic vents known as 'Rima Mairan' and 'Rima Sharp'.
- The young geological age of the rocks at the landing site narrows the search, as only craters of age less than 2 billion years can be responsible.
- These craters are relatively rare on the side of the Moon that faces Earth.
- Harpalus crater is a significant contributor of many exotic fragments among Chang'e-5's sample haul.

### ***Solar Storm & Internet***

*A new study has found that solar storms could cause disruption of the internet, damage submarine cables and communication satellites.*

- Previous studies have shown that there is a 1.6 to 2% chance of an extreme space weather event happening within the next decade.
- **Impacts of solar storm** - Longer submarine cables may be susceptible to higher risks.
- At ground level, solar storm-induced geomagnetic variations can cause harm by inducing large currents in networks that can conduct electricity.
- Although fibre-optic internet cables are themselves not conductors, their electronic components can be rendered useless by very strong storms.

- The countries in the lower latitudes are at a much lower risk.
- Also, compared to the US, India is less vulnerable.
- **Protection** - The paper mentions a 'shutdown strategy' that can help minimise the connectivity loss during and after a solar storm impact.
- A temporary Internet shutdown can protect our equipment during a solar event and ensure the continuation of services.

### Solar Storm

- Also known as Coronal Mass Ejection, solar storm is an ejection of highly magnetised particles from the sun into space.
- These particles can take about 13 hours to 5 days to reach Earth.
- Earth's atmosphere protects humans from these particles.
- But the particles can interact with our Earth's magnetic field, induce strong electric currents on the surface and affect man-made structures like earth's radio communication, GPS, Power grids and satellite.
- The 1<sup>st</sup> recorded solar storm occurred in 1859. It affected the telegraph network and many operators experienced electric shocks.

### Solar Cycle

- It is the cycle that the Sun's magnetic field goes through every 11 years - **cycles of high and low activity**. It also has a longer 100-year cycle.
- During the last 3 decades, when the internet infrastructure was booming, it was a low activity period of the Sun.
- Either in this cycle or the next cycle, we are going towards the peaks of the 100-year cycle. So, more studies should be done in order to protect our current infrastructure from powerful solar storms.

### Planet Nine

*A study says that it has found more evidence for a distant giant planet in our solar system called Planet Nine.*

- It has found that the Planet Nine could have a mass of 6.2 (+2.2/-1.3) Earth masses. It may be a typical extra-solar super-Earth.
- Planet Nine is not a new discovery. It had appeared in the images taken by the Hubble Space Telescope in 2004.
- It orbits far beyond Neptune in a highly eccentric orbit around the Sun.
- A 2018 study noted that a trans-Neptunian object called 2015 BP519 had an unusual trajectory as it was affected by Planet Nine's strong gravity.

### Terminologies

- **Criteria for Planet** - International Astronomical Union determines the criteria and vote on the decisions.
- The 3 conditions for a celestial object to be declared as a planet
  1. It must orbit the Sun.
  2. It should be massive enough to acquire an approximately spherical shape.
  3. It has to clear its orbit (being the object that exerts maximum gravitational pull within its orbit).
- **Dwarf Planet** - If a celestial object satisfies any 2 of the above 3 conditions, it is called as dwarf planet.
- It orbits the sun, and has enough mass to assume a nearly round shape.
- It has not cleared the neighbourhood around its orbit and is not a moon.
- **Exoplanet** is a planet outside the Solar System. The first confirmation of detection of exoplanet occurred in 1992.

### Detection of Dark Energy

*A team of researchers have made the first putative direct detection of dark energy using the XENON1T experiment (used to detect dark matter).*

- XENON1T experiment is the world's most sensitive dark matter experiment and operated deep underground at INFN Laboratori Nazionali del Gran Sasso, Italy.
  - Other similar experiments include LUX-Zeplin, a next generation dark matter experiment at Sanford Underground Research Facility, and PandaX-xT at China Jinping Underground Laboratory.
- XENON1T have been designed to directly detect dark matter, by searching for signs of dark matter 'hitting' ordinary matter.
- A physical model, which used chameleon screening, can be used to show that dark energy particles produced in the Sun's strong magnetic fields could explain the signal seen in XENON1T.

### **Dark Matter & Dark Energy**

- Everything we see - the planets, moons, galaxies, organisms - makes up less than 5% of the universe.
- About 27% is dark matter and 68% is dark energy.
- Dark matter's existence was suggested as early as the 1920s, while dark energy wasn't discovered until 1998.
- **Dark energy** is an unknown form of energy that is hypothesized to permeate all of space, tending to accelerate the expansion of the universe.
- Dark matter is a hypothetical form of matter thought to account for approximately 85% of the matter in the universe.
- Dark matter works like an attractive force that holds our universe together.
- This is because dark matter does interact with gravity, but it doesn't reflect, absorb or emit light.
- Meanwhile, dark energy is a repulsive force that causes the expansion of our universe.

Dark Matter	Dark Energy
Dark matter is a hypothetical form of matter thought to account for approximately 85% of the matter in the universe.	Dark energy is an unknown form of energy that is hypothesized to permeate all of space, tending to accelerate the expansion of the universe.
27% of the universe is dark matter	68% of the universe is dark energy
Dark matter works like an attractive force that holds our universe together.	Dark energy is a repulsive force that causes the expansion of our universe.

## **DEFENCE**

### **Arjun Mark-1A**

*Ministry of Defence has placed an order to Heavy Vehicles Factory (HVF), Chennai for 118 units of the Main Battle Tank Arjun's Mark-1A variant for the Army.*

- **Origin** - The development of Arjun was started by the DRDO in 1980s, primarily to augment the predominantly Russian-made armoured fleet until then. Work on the variant Mark-1A, or Mk-1A, began in 2010.
- **Advantages** - Mark-1A variant adds 72 new features to the previous variant Mark-1. These additions have resulted in
  1. Better all-terrain mobility and manoeuvrability in different modes of operation,
  2. Better target acquisition, and precision firing during both day and night with a 360° view,
  3. Suitability for the 4-member crew, who operate in tough conditions when deployed,
  4. Suitability for effective use of IT and computer networking in the battlefield, and
  5. Multi-layered robust protective armour named 'Kanchan'.

- These additions, along with its 120 mm rifled gun, have contributed to its categorisation as the ‘hunter killer’.
- Arjun Mark-1A is ideally suited for desert terrain, and even more effective and lethal compared to earlier variant due to the new additions.
- **Limitation** - Weight of the tank puts a limitation on its deployability in high-altitude terrains.

### ***Akash Prime Missile***

*A new version of the Akash Missile - „Akash Prime“ has been successfully flight tested from Integrated Test Range (ITR), Chandipur, Odisha.*

- Akash Prime is a medium-range mobile surface-to-air missile (SAM) system developed by Defence Research and Development Organisation (DRDO) and produced by Bharat Dynamics Limited (BDL).
- It can be fired from a tank or a wheeled truck to attack an aerial target.
- It was developed to replace the Russian 2K12 Kub (SA-6 Gainful) missile.
- **Advantages** - Akash Prime is equipped with an indigenous active Radio Frequency seeker for improved accuracy.
- Other improvements also ensure more reliable performance under low temperature environments at higher altitudes.
- Modified ground system of the existing Akash weapon system has been used for the current flight test.
- Akash Prime system will further boost the confidence of the Indian Army and Indian Air Force as the Akash system is already inducted and now getting improved with more lethal missiles.

### ***North Korea’s 1<sup>st</sup> Strategic Cruise Missile Test***

*North Korea’s 1<sup>st</sup> long-range Cruise Missile Test is nothing unusual, but it is of strategic relevance for a particular region.*

- North Korea already had cruise missiles, but they are a shorter range anti-ship system. Hence, this is not its 1<sup>st</sup> cruise missile test.
- But, it is –North Korea’s 1<sup>st</sup> long-range (1,000 km+) cruise missile and 1<sup>st</sup> claimed nuclear-capable cruise missile.
- These cruise missiles don’t come under UNSC sanctions that were placed on North Korea to curb its nuclear development programme.

### **Cruise Missiles**

- Cruise missiles are unmanned self-propelled, fast-moving, guided bombs that soar at a very low trajectory, parallel to the ground.
- They sustain flight through aerodynamic lift for most of its flight path and whose primary mission is to place an ordnance or special payload on a target.
- Most cruise missiles use a small, solid- propellant rocket booster, which allows them to gain enough altitude and speed for the onboard sustainer engine to take over.
- Cruise missiles are classified based on the speed as,
  1. Subsonic (around 0.8 Mach),
  2. Supersonic (2-3 Mach) and
  3. Hypersonic cruise missiles (more than 5 Mach).
- **Difference** - Cruise Missiles are distinct from regular (non-cruise) missiles primarily because they go really far and all such missiles have an internal guidance system.
- They differ from ballistic missiles as they travel within the earth’s atmosphere and aerodynamically maneuver for most of their flight time.

## HEALTH

### **Mu Variant**

WHO has classified yet another SARS-CoV-2 variant “B.1.621” as a variant of interest (VOI) and given it the label “Mu”.

- The variant was first identified in Colombia in January, 2021.
- **Spread** - The global prevalence of the Mu variant among sequenced cases has declined and is currently below 0.1%.
- However, prevalence in Colombia (39%) and Ecuador (13%) has consistently increased.
- Larger outbreaks were reported from countries in South America and Europe.
- Cases have also been reported in the UK, US and Hong Kong.
- It was added to Public Health England’s list of variants under investigation.

### **Classes of SARS-CoV-2 variants**

- **Variant of Interest** - A variant with specific genetic markers that have been associated with changes to receptor binding which affect its diagnosis and are expected to cause unique outbreak clusters.
- It is known for it *predicted increase in transmissibility*.
- It is classified based on factors such as genetic changes that are predicted or known to affect virus characteristics such as transmissibility, disease severity, immune escape etc.
- It represents a lower level of concern than a variant of concern (VOC).
- **Variant of Concern** - A variant for which there is *evidence of an increase in transmissibility, more severe disease* (e.g., increased hospitalizations or deaths).
- It is known for its significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures.
- Example - Alpha, Beta and Delta variants of SARS-CoV-2.
- **Variant of High Consequence** – It has clear evidence that prevention measures or medical countermeasures (MCMs) have significantly reduced effectiveness relative to previously circulating variants.

### **Breakthrough Infections**

Recently, there is a rise in „breakthrough infections‘ or confirmed infections in those people who have got the 2<sup>nd</sup> dose of the vaccine.

- Breakthrough infections‘ occur in people who have been vaccinated, as the virus can penetrate the protective barrier of antibodies.
- If a person gets infected with the SARS-CoV-2 virus 14 days after the 2<sup>nd</sup> shot of the vaccine, it is called a breakthrough infection‘.
- Mutations like Delta variant (B.1.617.2), Delta-Plus variants and Kappa variant (B.1.617.1) mostly help the virus escape detection by antibodies.
- Breakthrough infections are currently not translating into serious disease requiring hospitalisation.
- **Significance** - Number of breakthrough infections recorded‘ is low.
- Fully vaccinated healthcare workers, who due to prolonged exposure to many patients, are at greater risk of contracting breakthrough infections.
- None of the infections made the healthcare workers sick enough to warrant a test and so it could well be that the number of breakthrough infections‘ are much higher than those confirmed‘ by RT-PCR tests.
- The bigger concern is that those with a breakthrough infection‘ - under the belief that they are fully protected - may be less stringent with using masks and could be carriers of infection.

### Efficacy Rates of Vaccines

- In clinical trials, all vaccines available have reported efficacy rates between 70% and 90%.
- This implies that between 10% and 30% of a vaccinated population will be vulnerable to infection.

### R Value

*The R value, which reflects how rapidly the COVID-19 pandemic is spreading, dropped to 0.92 by mid-September after going over one in August-end.*

- R-value or R-factor or  $R_0$  (R-naught) or Reproduction Rate refers to how many persons an infected person infects on an average.
- It indicates the speed at which the Covid infection is spreading in the country, along with the 'efficiency' of the spread.
- **Interpretation** - An R-Factor of 1 would mean that an infected person is giving the virus to 1 other person. An R-Factor of 5 would mean that 1 person is spreading the virus to 5 other people.
- A NITI Aayog member says that R number should be 0.6 or below. If it is above 1, it shows that it is a significant problem and the virus wants to spread.

### Fragile X Syndrome

- It is a genetic disorder that causes a range of developmental problems including learning disabilities and cognitive impairment.
- It is the leading inherited cause of autism in 4% of the global population.
- It is caused by changes in FMR1 gene which make an important protein (FMRP) that is required for brain development.
- It is caused by the mutation named FRAXA.
- **Mutation** - A mother who is a carrier has a 50% chance of passing the mutated gene to her children, who will either be carriers or have FXS.
- Men who are carriers do not pass the pre-mutation to their sons, but only daughters, who become carriers.
- **Effect** - Males are more severely affected by this disorder than females.
- Studies suggest a high effect of consanguineous parenting on FXS prevalence. (Consanguineous is a term relating to or denoting people descended from the same ancestor.)
- **Detection** - The simplest tool for timely detection is a DNA test. This testing could be made mandatory for every child diagnosed with autism.
- **Symptoms** - Learning difficulty, speech delay, aggressive behaviour, hyperactivity, attention deficit, fear of the unfamiliar, sensory processing disorders and problems in motor skills.
- It cannot be cured, but early therapy can improve a person's quality of life.

### FXS in India

- In India, FXS is largely undetected because of,
  1. Lack of adequate, affordable screening and diagnostic facilities,
  2. Stigma attached to mental health,
  3. Absence of surveys in community settings, and
  4. Bare minimum hospital data based on clinical experience.
- Without naming FXS, National Policy for Rare Diseases 2021 advises prenatal tests for lesser-known single-gene and other genetic disorders directly.
- To know more about the National Policy for Rare Diseases,

### ***Gambusia Fish to Control Dengue***

*Firozabad district administration has released Gambusia fish (mosquitofish) that eat dengue-breeding mosquito larvae in ponds.*

- This **Insectivorous fish** is known to check the spread of mosquito-borne diseases like malaria and dengue.
- Gambusia eats about 100 larvae daily.
- They are bred in ponds, wells and other shallow water bodies, which are the breeding grounds of mosquitoes.
- This makes them an excellent **biological tool** for mosquito control as they eat the larvae before they develop into adult mosquitoes.
- Besides Gambusia, guppy fish is used to check the spread of mosquito-borne diseases. They are bred in the same manner as Gambusia.
- A **WHO study** said that this strategy of using indigenous or exotic fish species with larvivorous potential (fish that feed on larvae) is potentially safer as it doesn't involve use of insecticides.
- It also states that this strategy is scientifically proven to be effective in malaria control.

### **Biocontrol**

- Biocontrol is the management of a pest or an insect, typically invasive species, using biological agents.
- It is defined as the reduction of pest populations by introducing a natural predator into the environment.
- Also known as Biological Control or natural control, it is a component of an integrated pest management strategy.
- Examples of biological control agents are predators, parasitoids, pathogens, insects, nematodes, etc.,

### ***Havana Syndrome***

*The CIA director and a US intelligence officer have reported symptoms of Havana Syndrome while the two were in India recently.*

- Havana Syndrome is a set of mental health symptoms that are experienced by US intelligence and embassy officials in other countries.
- This Syndrome traces its roots to Cuba (2016), where the US officials in their embassy began experiencing the symptoms.
- **Symptoms** are hearing certain sounds without any outside noise being present, nausea, vertigo and headaches, memory loss and issues with balance.
- The injuries in the brains of the victims resembled concussions, like those suffered by soldiers struck by roadside bombs in Iraq.
- **Causes** - No one is entirely sure of the causes of Havana Syndrome.
- But, some studies suggest that the victims may have been subjected to high-powered microwaves that interfered with the nervous system. It has had lasting impact on mental health.

### **Microwave weapons**

- They are a type of direct energy weapons, which aim highly focused energy in the form of sonic, laser, or microwaves, at a target.
- People exposed to high-intensity microwave pulses can have both acute and long-term mental effects, **without any physical damage**.
- Greater exposure to high-powered microwaves is said to
  1. Interfere with the body's sense of balance, and
  2. Impact memory and cause permanent brain damage.



## OTHERS

### ***Blood Honey***

- Sunderbans being the home to the Royal Bengal tigers, every year people die venturing into the forests to collect this honey. Due to the risks involved in its collection, it is called blood honey.
- It is also called Sundarban honey, as it is collected by the Sunderbans' Moulis community.
- This comparatively less thick honey has high demand for its nutritional value and purity.
- As this honey is multi-floral and there is practically no use of antibiotics or pesticides in Sundarbans.
- It is nearly twice as expensive as the branded honey.
- **Reasons for the high cost** - One major part of the cost input is going deep into the forest area. This means that there are also no pesticides or chemicals or any other impurities in this honey.
- Additionally, the purpose of ventures like this is the financial upkeep of this community too.

### ***Indian Royal Jelly***

*For the first time, Indian Royal Jelly has been found to surpass top-quality global sellers.*

- It is a pearly white or pale yellow-coloured cohesive mixture of honey and secretions from worker honeybees.
- Composition of Indian Royal Jelly
  1. Moisture Or Water (60-70%),
  2. Lipids (1-10%),
  3. Minerals (0.8-3 %),
  4. Proteins (9-18 %),
  5. Sugar (7 %)
- **Artificial Production** – The bee colonies grown outside its natural habitat are stimulated to produce queen bee.
- The larvae in the queen bee are then fed with nutritious royal jelly, which gets accumulated in maximum amount upon 5th day.
- In a season of 5 to 6 months, a well-maintained hive can produce an estimated 900gms of royal jelly.
- The quality and protein content of the jelly varies from the plant and their respective pollen.
- Honeybees that gather pollen from mustard, coconut and multi-flora variants produce top international quality jelly whereas maize pollens were not as good.
- **Requirements** –
  1. Recommended Temperature is below –20°C
  2. A special machine called Freezee drier to remove moisture from the fresh produce.
  3. It needs to be stored in sub-zero temperatures immediately after production and throughout its supply chain.
- **Uses** – It is highly nutritious and a good antioxidant. It helps women with fertility issues.
- **Standards** - It meets the ISO-prescribed standards imposed by the Food Safety and Standards Authority of India in 2019.
- It is based on the concentration of moisture, sugars, protein and Hydroxy acids with 10 carbon atoms (10 HDA), a fatty acid found in the jelly.
- Presently, country specific standards are available only in Switzerland, Bulgaria, Brazil and Uruguay.

- Indian royal jelly is been found as better in quality than jelly produced from Thailand and China and almost same as the Italian royal jelly.

### ***Planetarium Innovation Challenge***

*MyGov India has launched the Planetarium Innovation Challenge for tech start-ups and entrepreneurs (based out of India).*

- The challenge aims to bring together the Start-ups with the potential to build indigenous planetariums system software using technologies like
  - Augmented Reality (A.R.),
  - Virtual Reality (V.R.) and
  - Merged Reality (M.R.).

### **Augmented Reality (AR)**

- Augmented reality is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology.
- Almost any person with a **smart phone** can get access to AR, making it more efficient than VR as a branding and gaming tool.

### **Virtual Reality (VR)**

- Virtual Reality produces an entirely computer-generated simulation of an alternate world.
- These immersive simulations can create almost any visual or place imaginable for the player using **special equipment** such as computers, sensors, headsets, and gloves.

<b>Augmented Reality (AR)</b>	<b>Virtual Reality (VR)</b>
AR uses a real-world setting.	VR is completely virtual.
AR users can control their presence in the real world.	VR users are controlled by the system.
Accessed with a smartphone.	Requires a headset device.
Enhances both the virtual and real world	Only enhances a fictional reality

### **Merged Reality**

- Merged Reality or Mixed Reality is when the real and virtual world are merged and objects from both can interact.
- For example, Intel's Project Alloy uses mixed reality to allow people to use their real hands in the virtual world.
- Before this point, users had to hold controllers that represented their hands.

### ***LiFi Network***

*Students' Educational and Cultural Movement of Ladakh (SECMOL), India's highest altitude educational organisation, has become the 1<sup>st</sup> institute in Ladakh to have an internet connection using LiFi technology.*

- Light Fidelity (LiFi) is a wireless communication technology that **transmits data with a light beam spectrum** through open space in outdoor and indoor environments.
- It is a Visible Light Communications (VLC) system that has components such as,
  1. Solid-state lighting (SSL) such as LED bulbs,
  2. Photo-detector (photodiode) to receive light signals and
  3. Signal processing element to convert the data (embedded in the light beam) into \_\_stream-able\_\_ content.

- Data is fed into an LED light bulb (with signal processing technology). Then the LED bulb sends data at rapid speeds to the photo-detector.
- **Uses** - LiFi systems provide ultra-fast, safe and cheap data connections.
- They are chiefly useful in urban areas where radio spectra are congested.
- They are also very useful in rural areas wherein Fiber Optic Cables or networks are not reachable.
- **Specialty** - LiFi can be up to 100 times faster than Wi-Fi.

## 23. INDEX AND REPORT

### **Internet Freedom Index**

*The 11th edition of the „Freedom on the Net“ Report was released by the Freedom House.*

- **Findings** - China stood last in this index for the 7<sup>th</sup> consecutive year.
- India is among the 20 countries that shut internet for a section of society this year. The report criticised India for Internet Shutdowns and the New IT Rules.
- Freedom on the Net is Freedom House's annual survey and analysis of internet freedom around the world.
- This cutting-edge project consists of ground-breaking research and analysis, fact-based advocacy, and on-the-ground capacity building.
- It features a ranked, country-by-country assessment of online freedom, a global overview of the latest developments, as well as in depth country reports.

### **Global Innovation Index 2021**

*World Intellectual Property Organization (WIPO) in partnership with the Portulans Institute has released the Global Innovation Index (GII) 2021.*

- India has climbed 2 spots and has been ranked 46<sup>th</sup>. India's rank has been consistently rising in the last few years from 81 (2015) to 46 (2021).
- The GII ranks 131 countries and economies based on their innovation capabilities, including roughly 80 indicators, grouped into innovation inputs and outputs.
- The GII is the fulcrum for the governments - across the world - to assess the social and the economic changes in their respective countries.
- Over the years, the GII has established itself as a policy tool for various governments and helped them to reflect upon the existing status quo.

### **Groundswell Report**

*This report, released by the World Bank, has warned that the Climate change could push more than 200 million people to leave their homes by 2050 unless urgent action is taken.*

- Under the most pessimistic scenario, the report predicts more than 216 million people across 6 world regions could be on the move by 2050.
  - This will lead to –hotspots of internal climate migration by 2030 that will continue to spread and intensify by 2050.
  - **Sub-Saharan Africa** has been identified as the most vulnerable region due to desertification, fragile coastlines and the population's dependence on agriculture.
- Under the most climate-friendly scenario, the world could still see 44 million people being forced to leave their homes.
- Globally, 3 out of 4 people that move stay within countries.
- **Suggestions** - The report provides recommendations that can help slow the factors driving climate migration.
  1. Achieving net-zero emissions by mid-century (Temperature goals of the Paris Agreement),
  2. Embedding internal climate migration in green, resilient, and inclusive development planning,
  3. Preparing for each phase of migration, so that internal climate migration as an adaptation strategy can result in positive development outcomes.

The World Bank has called on states to reduce global emissions and bridge the development gap to avoid the effects of slow-onset climate change such as water scarcity, decreasing crop productivity, etc.

### ***3<sup>rd</sup> State Food Safety Index***

*Recently, the Food Safety and Standards Authority of India (FSSAI)'s 3<sup>rd</sup> State Food Safety Index (SFSI) was released.*

- This Index measures the performance of States across 5 parameters of food safety, which include,
  1. Human Resources and Institutional Arrangements,
  2. Compliance,
  3. Food Testing - Infrastructure and Surveillance,
  4. Training and Capacity Building and
  5. Consumer Empowerment.
- It is a dynamic quantitative and qualitative benchmarking model that provides an objective framework for evaluating food safety across all States/UTs.
- Among the larger states, this year, Gujarat, Kerala and Tamil Nadu secured top ranks.
- Among the smaller states, Goa, Meghalaya and Manipur secured top ranks.
- Among UTs, Jammu & Kashmir, Andaman & Nicobar Islands and New Delhi secured top ranks.

### **Food Safety and Standards Authority of India (FSSAI)**

- It is an autonomous body under the Ministry of Health & Family Welfare.
- It is a statutory body established under the Food Safety and Standards Act, 2006.
- FSSAI monitors and governs the food business in India.
- FSSAI License is responsible for protecting and promoting public health through the regulation and supervision of food safety.

### **Food Safety and Standards Act, 2006**

- It is a consolidated statute related to food safety and regulation in India.
- It established the FSSAI and the State Food Safety Authorities for each State.
- It aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi-departmental control to a single line of command.

### ***Plant Discoveries 2020***

*The Botanical Survey of India (BSI) has published its new Plant Discoveries 2020.*

- It has added 267 new taxa/ species to the country's flora.
- Of the 267 new taxa/ species, 202 new plant species were discovered across the country and 65 new records were added.
- It a document on new species and new records of flora that has been prepared by the BSI and released by the Environment Ministry since 2007.

### ***Report of Quarterly Employment Survey***

*The report of first quarter of Quarterly Employment Survey (QES) part (April to June 2021) was released.*

- This quarterly report is a part of the All-India Quarterly Establishment-based Employment Survey (AQEES) prepared by the Labour Bureau.
- The AQEES provide frequent (quarterly) updates about the employment and related variables of establishments, in **both organised and unorganised** segments of **9 selected sectors**.
- **9 selected sectors** - Manufacturing, Construction, Trade, Transport, Education, Health, Accommodation and Restaurant, IT/ BPO and Financial Services.
- These sectors altogether account for a majority of the total employment in the non-farm establishments.
- **Highlights of QES** - Of the total employment estimated in the selected 9 sectors, manufacturing accounts for 41%, education 22%, Health 8%, and also Trade and IT/BPO each engaged 7%.
- The most impressive growth of 152% has been recorded in the IT/BPO sector.
- Growth rates were seen in Health, Education, Manufacturing, Transport and Construction. But, employment in Trade, Accommodation & Restaurant came down.
- Nearly 90% of the establishments have been estimated to work with less than 100 workers, the corresponding figure during Economic Census (EC 6) being 95%.
- Over-all participation of female workers stood at 29%, slightly lower than 31% reported during 6th EC.
- Regular workers constitute 88% of the estimated workforce in the nine selected sectors, with only 2% being casual workers.
  - But, 18% of workers in the Construction sector are contractual employees and 13% are casual workers.
- Only 9% of the establishments (with at least 10 workers) were not registered with any authority or under any act.
- 26% of all the establishments were registered under the Companies Act.
- Around 18% of the establishments have provision of on-job skill training programmes.

### ***All-India Quarterly Establishment-based Employment Survey***

- There are two components under AQEES,
  1. Quarterly Employment Survey (QES) and
  2. Area Frame Establishment Survey (AFES).
- QES has been initiated to compile relevant data from about 12,000 establishments selected through a sampling design to represent each of the nine sectors within each state/ Union Territory, as also each size-class (range of number of workers) within each sector-State/ UT.
- AFES covers the unorganised segment (with less than 10 workers) through a sample survey.
- AQEES will provide a consolidated picture with both the organised and the unorganised segments of the non-farm economy.

## PRELIMS PRACTICE QUESTIONS

1) China has recently inaugurated a trade corridor linking the Indian Ocean with south-western China. With reference to the trade corridor, consider the following statements:

1. The transport corridor comprises three modes of transport viz, sea-road-rail link.
2. It was developed as a part of China Pakistan Economic Corridor (CPEC).
3. The passage connects the logistics lines of Pakistan, Myanmar and China.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

2) With reference to UNSC Resolution 2593, adopted recently, consider the following statements:

1. The resolution called upon host States to promote accountability for the killing and all acts of violence against the UN peacekeeping personnel.
2. It specifically mentions individuals designated by the UNSC resolution 1267, which includes the Lashkar-e-Taiba and the Jaish-e-Mohammad.
3. All the 15 members of the Council voted unanimously in favour of the resolution.

Which of the statement(s) given above is/are correct?

- a. 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

3) Consider the following statements:

1. The river flows in both India and Bangladesh and act as a natural boundary between Jaintia and Khasi Hills.
2. Over this river hangs a single span suspension bridge called Dawki Bridge.
3. The river is considered as the cleanest river in India and in some parts is as transparent as crystal and you can actually see the river bed.
4. The river passes through the Asia's Cleanest Village, Mawlynnong.

Identify the river that correctly matches with the above description:

- a. Kynshi River
- b. Umngot River
- c. Jinjiram River
- d. Simsang River

4) Consider the following statements with respect to Self-Reliant India (SRI) Fund

1. It is an Alternative Investment Fund to provide growth capital for Micro, Small and Medium Enterprises (MSMEs).
2. The fund will have a Mother Fund/Daughter Fund structure with a corpus of Rs.10,000 crore as Mother Fund.
3. Govt. of India will be the sole anchor investor of the fund.

Which of the statement(s) given above is/are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

5) Consider the following statements about The Factoring Regulation (Amendment) Act 2021

- 1. It allowed the participation of NBFCs in the TReDS (Trade Receivables Discounting System) platform.
- 2. For NBFCs, the income from the factoring business should be more than 50% of the gross assets/net income.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

6) Which of the following are the impacts of using Antibiotics in cows?

- 1. Decrease in ability of the Soil to store carbon
- 2. Change in Soil's bacterial community structure
- 3. More carbon in the atmosphere in the form of CO<sub>2</sub>

Choose the correct option:

- a. 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

7) Which of the following countries has recently declared Food Emergency due to drain of Forex to finance imports?

- a. Morocco
- b. Sri Lanka
- c. Afghanistan
- d. Sudan

8) Consider the following statements about Attingal Outbreak

- 1. It is one of the earliest organised rebellions against the East India Company that erupted way back in 172
- 2. Maharaja of Mysore rose against the corrupted East India Company officers involved in the monopoly of spices.
- 3. The construction of Anjengo fort by the EIC sparked rivalry between native ruler and EIC.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

9) Consider the following statements about State of the World's Trees

1. According to the report, Climate change is the leading factor for the increase in threatened treespecies.
2. Madagascar is one of the countries with the highest number of threatened trees.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2

10) Panjshir Valley, often seen in the news recently, is located in?

- a. Pakistan
- b. Mongolia
- c. Tajikistan
- d. Afghanistan

11) Consider the following statements with respect to Anaimalai Flying Frog

1. It is endemic to the southern part of Eastern Ghats, Tamil Nadu.
2. The female creates foam nests on leaves, into which the eggs are laid and the male fertilises them.
3. It was listed as Critically Endangered under the IUCN Red list of threatened species.

Which of the statement(s) given above is/are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

12) Ashok Kumar Tandon Committee, sometimes seen in the news recently, was constituted for which of the following purposes?

- a. To probe Pegasus snooping issue
- b. To reform Journalists Welfare Schemes
- c. To suggest measures for Sustainable Fisheries Management
- d. To study the impact of traditional health practices in rural villages

13) With respect to 1988 sanctions committee, sometimes seen in the news recently, consider the following statements:

1. The committee oversees the sanctions measures imposed by the UN Security Council (UNSC) on Al-Qaeda.
2. India will chair the 1988 sanctions committee for the period from 2021-22.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

14) With respect to Green List of Protected and Conserved Areas (GLPCA), consider the following statements:

1. It is the first global standard of best practice for area-based conservation.



2. It is being developed by International Union for Conservation of Nature (IUCN) and partners.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

15) Consider the following statements with respect to Climate Adaptive Planning for Resilience and Sustainability (CAP-RES) Programme

- 1. The mission focuses on five broad thematic areas to address the knowledge gap across the specified themes of resilience and sustainability.
- 2. The mission was supported by the Department of Science & Technology under the National Knowledge Mission on Climate Change.
- 3. The mission would be implemented by the National Institute of Disaster Management which works under the Ministry of Home Affairs.

Which of the statement(s) given above is/are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

16) Consider the following statements with respect to Eastern Economic Forum, 2021

- 1. It was established by the Russian Federation in 2015.
- 2. It is an international platform aiming to foster communication and cooperation between members from Russia and the Asia-Pacific region.
- 3. The main theme of this year's Forum is 'New Opportunities for the Far East in a Changed World'.

Which of the statement(s) given above is/are correct?

- a. 3 only
- b. 1 and 2 only
- c. 2 and 3 only
- d. 1, 2 and 3

17) Which of the following places is/are closely associated with Mahatma Gandhiji?

- 1. Mhow
- 2. Pietermaritzburg
- 3. Aga Khan Palace
- 4. Chaitya Bhoomi

Select the correct answer using the codes given below:

- a. 3 only
- b. 2 and 3 only
- c. 3 and 4 only
- d. 1, 2, 3 and 4

18) Which one of the following correctly describes the term, Breakthrough Infection, sometimes seen in the news recently?

- a. It occurs when a -variant of interest becomes a -variant of concern in a very short period of time.
- b. It is a condition in which a person gets infected with SARS-CoV-2 virus after 14 days of the second shot of vaccine.
- c. It is an important discovery and recognition of a rapidly spreading unidentified variant of SARS-CoV-2 by WHO.
- d. It is a condition where preventive steps taken to control a new variant have reduced the effectiveness related to previously circulating variants.

19) Which of the following statements regarding the Karbi-Anglong Peace Agreement is not correct?

- a. It will transfer as much autonomy as possible in exercising their rights to the KarbiAnglong Autonomous Council.
- b. A special development package of Rs. 1000 crore will be allocated by the Assam Government for the development of Karbi areas over five years.
- c. This agreement will ensure the protection of the culture, identity, language of the Karbi people and all-round development of the region.
- d. The Consolidated Fund of the State of Assam will be amended to meet the resources of the KarbiAnglong Autonomous Council.

20) Consider the following statements about Nipah Virus

- 1. It has an incubation period of 5-14 days.
- 2. It was first identified in Malaysia and first reported in West Bengal in India.
- 3. It can be transmitted through contaminated food.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. 1 and 2 only
- d. 1, 2 and 3

21) Which one of the following best describes the term Animal Spirits in Economics?

- a. It refers to the ability of humans to exchange one thing for another
- b. It refers to an act of sustainable use of scarce economic resources for a long time
- c. It describes how people tend to value an object more if they make or assemble it themselves
- d. It refers to the emotions and instincts that guide the behaviour of investors in a market economy

22) Consider the following statements with respect to Inspiration4, sometimes seen in the news recently

- 1. It is the World's first all-civilian, non-governmental spaceflight to orbit around the Earth.
- 2. The Inspiration4 will orbit the Earth at 575km higher than the International Space Station and the Hubble space telescope.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

23) Which among the following is directly responsible for the monitoring of Asset Monetisation programme?

- a. Department of Economic Affairs, Ministry of Finance
- b. Department of Investment and Public Asset Management, Ministry of Finance
- c. Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry
- d. None of the above

24) Consider the following statements about Deep Sea Mining

- 1. It is the process of retrieving mineral deposits from the area of the ocean below 2000 m.
- 2. International Tribunal for the Law of the Sea regulates all mineral-related activities in the international seabed area beyond the limits of national jurisdiction.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

25) Gita Govinda is a 12th Century lyrical poem which describes the relationship between Krishna and Radha. The poem was composed by?

- a. Harihara
- b. Jayadeva
- c. Bhavabhuti
- d. Amarasimha

26) Blood Honey, sometimes seen in the news recently, refers to?

- a. Honey collected by traditional honey gatherers of Sunderbans
- b. Artificial production of Indian Royal Jelly outside its natural habitat
- c. A unique variety of honey in Thailand obtained from the blood of bees instead of its salivas
- d. Highly profitable honey obtained through exploitation of traditional honey gathering tribes in Africa

27) Consider the following statements about Basmati Rice

- 1. It is grown in the foothills of the Himalayan region forming a part of the Indo-gangetic plain.
- 2. Punjab holds Geographical Indication tag for Basmati Rice.
- 3. On the global level, India and Pakistan are fighting for GI tag for it in the European Union.

Which of the statements given above is/are correct?

- a. 2 only
- b. 3 only
- c. 1 and 3 only
- d. 1 and 2 only

28) Consider the following statements about Hycean Worlds

- 1. They are new class of exoplanets which are 2.6 times larger than Earth.
- 2. It has water rich interiors and hydrogen rich atmospheres.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

29) Which of the following crops are considered for the rabi marketing season under the Minimum Support Price (MSP)?

- 1. Barley
- 2. Mustard
- 3. Soyabean
- 4. Safflower
- 5. Sesamum

Choose the correct option

- a. 1, 2 and 3 only
- b. 1,2 and 4 only
- c. 1, 3,4 and 5
- d. 1,2,3, 4 and 5

30) A recent carbon dating analysis of rice with soil, found in a burial urn in Tamil Nadu, has yielded the date of 1155 BC, thus dating back to 3,200 years.

The above description refers to which of the following Civilizations?

- a. Porunai
- b. Keezhadi
- c. Kodumanal
- d. GangaikondaCholapuram

31) Groundswell Report is a series of reports published by?

- a. World Bank Group
- b. Food and Agricultural Organization
- c. Sustainable Development Solutions Network
- d. Office of the UN High Commissioner for Human Rights

32) Consider the following statements with respect to Software as a Service (SaaS)

- 1. It is a way of delivering applications in which software itself is considered as a service industry.
- 2. It allows each user to access software via Internet, instead of having to install the software on the user's computer.
- 3. It converted a company's fixed costs into variable costs and frees up capital for more high priority requirements.

Which of the statement(s) given above is/are correct?

- a. 1 and 3 only
- b. 3 only`
- c. 1, 2 and 3
- d. 1 and 2 only

33) Shoonya Campaign, sometimes seen in the news recently, is associated with?

- a. A Roadmap to zero new HIV infections
- b. To promote zero pollution delivery vehicles
- c. To achieve zero malnutrition related deaths in India
- d. Awareness program about India's net zero emission targets

34) Consider the following statements with respect to Grindadrap, sometimes seen in the news recently

- 1. It is a traditional annual practice of sea mammal hunting practiced in Faroe Islands, Denmark.
- 2. The hunt usually focuses on whales rather than dolphins.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

35) Oxybenzone, Octinoxate and Octocrylene are known as Toxic 3 Os. Which of the following statements are correct with respect to Toxic 3 Os?

- 1. Toxic 3 Os are active ingredients present in sunscreens, which can trigger health risks to people and marine life.
- 2. Octocrylene is particularly toxic to corals which may severely damage or kill coral.

Select the correct answer using the codes given below:

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

36) Which of the following correctly describes R Corona Borealis?

- a. Hydrogen-deficient Star
- b. High precision parallax collecting Satellite
- c. Bright dancing lights in Northern Hemisphere
- d. A small constellation in the Northern Celestial Hemisphere

37) Consider the following statements with respect to AUKUS Agreement

- 1. It is a trilateral security partnership between France, the United Kingdom and the United States.
- 2. Under the Agreement the United States will help Australia to deploy nuclear-powered submarines in the Pacific region.
- 3. The deal explicitly mentions that it is a step towards curtailing China, especially in and around the South China Sea.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. 1 and 2 only

d. 1, 2 and 3

38) With respect to Low-C bricks, sometimes seen in the news recently, consider the following statements:

1. These are low carbon bricks produced using construction and demolition (C&D) wastes and alkali-activated binders.
2. They are manufactured either through high-temperature firing or using high-energy carbon binders such as Portland cement.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

39) Consider the following statements:

1. Generally, Indian coal has high ash content.
2. In India, coking coal dominates the total coal resources than non-coking coal.
3. Out of the total lignite reserves in India, 90% occur in the southern State of Tamil Nadu.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

40) Consider the following statements:

1. The Guptas were the first to build structural temples.
2. Dashavatara Temple in Uttar Pradesh is one of the structural temples built during Guptas.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

41) Consider the following statements with respect to Shankhalipi Script

1. It is a term used by scholars to describe ornate spiral characters assumed to be Brahmi derivatives that look like conch shells.
2. They are found in inscriptions across north-central India and dated between 4th and 8th centuries.
3. Both Shankhalipi and Brahmi are stylised scripts used primarily for names and signatures.

Which of the statement(s) given above is/are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

42) Which of the following statements is incorrect about Black Tigers?

- a. Black Tigers are result of true melanism, a condition characterised by unusually high deposition of melanin
- b. Black Tigers have stripes that are broadened and fused together
- c. Black Tigers are caused by recessive (hidden) genes, which are rare in nature
- d. Natural selection is also favouring melanistic leopards

43) Consider the following statements with respect to R-value

- 1. It indicates the speed at which a disease is spreading in the country, along with the efficiency of the spread.
- 2. Higher the R-value number, the more contagious is the disease caused by the virus and the faster it will spread in the community.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

44) With respect to Trojan Asteroids, consider the following statements:

- 1. These are leftovers of the primordial material from which Jupiter and the other outer planets were formed.
- 2. It orbits the Sun in two loose groups, with one group leading ahead of Jupiter in its path and the other trailing behind the planet.
- 3. European Space Agency's Mission Lucy is the First Mission to study the Trojan Asteroids.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

45) Vishnuonyx, sometimes seen in the news recently, refers to?

- a. Genus of otters lived in the major rivers of southern Asia
- b. A family of open source Unix-like operating system
- c. AI-assisted, satellite-operated robotic machine gun
- d. None of the above

46) DRINK, often seen in the news recently, refers to?

- a. Alcohol Museum
- b. Banking malware
- c. Campaign on Climate Change
- d. Clean water & Sanitation Campaign

47) Consider the following statements with respect to WHO Air quality guidelines

- 1. It recommends levels and interim targets for common air pollutants like PM, O<sub>3</sub>, NO<sub>2</sub>, and SO<sub>2</sub>.
- 2. The guidelines will be reviewed and updated annually by the World Health Organization (WHO).

3. These guidelines are neither standards nor legally binding.

Which of the statement(s) given above is/are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

48) Which of the following countries are part of QUAD, AUKUS and Five Eyes Alliance?

- 1. Japan
- 2. Australia
- 3. United Kingdom
- 4. United States of America

Select the correct answer using the codes given below:

- a. 1 and 2 only
- b. 2 and 4 only
- c. 1, 2 and 4 only
- d. 1, 2, 3 and 4

49) How is Dark Matter different from Dark Energy?

- 1. Dark energy attracts and holds galaxies together whereas dark matter repels and causes the expansion of our universe.
- 2. Despite both components being invisible, dark energy is even more elusive than dark matter.

Which of the statement(s) given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

50) Consider the following statements with respect to Green Voyage 2050 Project

- 1. It is a partnership project between the Government of Norway and International Maritime Organization (IMO).
- 2. It supports developing countries, including Small Islands Developing States and Least Developed Countries in their efforts to reduce GHG emissions from ships.
- 3. India is one of the partnering countries of the project.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3



## Answers

1. a

- The first shipments on a newly-launched railway line from the Myanmar border to the key commercial hub of Chengdu in western China were delivered last week.

### Transport Corridor

- It involves a sea-road-rail link.
- This passage connects the logistics lines of Singapore, Myanmar and China, and is currently the most convenient land and sea channel linking the Indian Ocean with southwest China.
- Goods from Singapore reached Yangon Port, arriving by ship through the Andaman Sea of the northeastern Indian Ocean, and were then transported by road to Lincang on the Chinese side of the Myanmar-China border in Yunnan province.
- The new railway line that runs from the border town of Lincang to Chengdu, a key trade hub in western China, completes the corridor.
- The one-way journey saves 20 to 22 days.

### Other Plans of China

- **Kyaukphyu Port** - China also has plans to develop another port in Kyaukphyu in the Rakhine state of Myanmar including a proposed railway line from Yunnan directly to the port, but the progress there has been stalled by unrest in Myanmar.
- **Gwadar Port** - Chinese planners have also looked at the Gwadar port in Pakistan as another key outlet to the Indian Ocean that will bypass the Malacca Straits.
- Gwadar is being developed as part of the China Pakistan Economic Corridor (CPEC) to the far western Xinjiang region, but has been slow to take off amid concerns over security.

2. a

### UNSC Resolution 2593

- The resolution demanded that Afghan territory not be used to threaten or attack any country and reiterated the importance of combating terrorism in Afghanistan.
- The resolution adopted by a vote of 13 in favour with two abstentions (Russian Federation and China).
- The resolution also urged Taliban's to assist the safe evacuations of all Afghan nationals wishing to leave the country.
- It specifically mentions individuals designated by the UNSC resolution 1267, which includes the Lashkar-e-Taiba (LeT) and the Jaish-e-Mohammad (JeM).

3. b

- The Meghalaya government has recently scrapped an agreement with private power developers to execute the proposed 210 MW Umngot hydroelectric project following protests.

### Umngot River

- It flows both in India & Bangladesh.
- It separates East Khasi Hills District from Jaintia Hills District by creating a boundary in between the two.
- It is the natural boundary between RiPnar (of Jaintia Hills) with HimaKhyrim (of Khasi Hills).
- Over the river hangs a single span suspension bridge called Dawki Bridge.
- Umngot River is considered as the cleanest river in India and in some parts is as transparent as crystal and you can actually see the river bed.
- Umngot River is also called by the name Dawki River, which has greenish-bluish color transparent water.
- The Umngot River passes through the village of Mawlynnong in Meghalaya, close to India's border with Bangladesh, which is touted as –Asia's Cleanest Village".

4. d

### Self Reliant India (SRI) Fund

- It is an Alternative Investment Fund (AIF), for providing growth capital to the Micro, Small and Medium Enterprises (MSMEs), through equity/quasi-equity/equity like structured instruments.
- This will facilitate them to move towards listing on the Stock Exchanges and in becoming National and International Champions by growing beyond the bracket of MSME.
- The Fund is to be anchored by NSIC Venture Capital Fund Limited (NVCFL).
- NVCFL is a wholly owned subsidiary of The National Small Industries Corporation.
- **Structure of the fund** - SRI Fund will have a Mother Fund / Daughter Fund structure with a corpus of INR 10,000 crore as Mother Fund.
- Govt. of India will be the sole anchor investor and provide an initial budgetary support of Rs. 10,000 crore to the Mother Fund in phased manner.
- Mother Fund will provide funds only to the Daughter Funds for onward investment as growth capital, while the investment in MSMEs will be done by the Daughter Funds.
- Both the Mother and Daughter Funds will be duly registered as Alternate Investment Funds with SEBI.
- **Fund Life** - The SRI Fund will have a life of 15 years and it will be a revolving fund.

5. a

#### **The Factoring Regulation (Amendment) Act 2021**

- Factoring business is a business where an entity acquires the receivables of another entity for an amount.
- Factor can be a bank, a registered non-banking financial company or any company registered under the Companies Act.
- Receivables are the total amount that is owed or yet to be paid by the customers (referred as the debtors) to the assignor for the use of any goods, services or facility.
- The Act allowed participation of non-banking finance companies (NBFCs) in the TReDS platform.
- It will bring in over 9,000 NBFCs into the factoring business against the current participation of just 7 NBFCs.
- The act removes the threshold of NBFCs in which 50% of the gross assets/net income from factoring business.
- It also amended the definitions of "receivables", "assignment", and "factoring business" to bring them at par with international definitions.
- TReDS is an electronic platform for facilitating financing of trade receivables of Micro, Small and Medium Enterprises.

6. d

#### **Effects of Antibiotics in soil**

- Carbon in soils exposed to manure from cows administered with antibiotics, travelled into the above-ground plant material, to the roots of the plants, into the soil and respired back out as CO<sub>2</sub> much faster than any of the others.
- This means that when antibiotics are used, less carbon is stored in the soil and more is lost to the atmosphere as CO<sub>2</sub>
- It can change soil microbiome and decrease their ability to store carbon
- It also affects soil respiration and elemental cycling
- It also caused changes in the soil's fungal and bacterial ratios as well as altered the bacterial community structure.

7. b

- Sri Lanka has recently declared a state of emergency over food shortages as private banks run out of foreign exchange to finance imports.
- The emergency regulation allows government officials to seize food stocks held by traders and arrest people who hoard essential food.
- Sri Lanka's foreign reserves fell to \$2.8 billion at the end of July 2021, from \$7.5 billion in November 2019.

- Tourism was the only vital source of foreign exchange earnings, but that too suffered due to the coronavirus pandemic.
- It has more foreign debt payments of \$1.5 billion each due in the next 12 months. It has already paid \$1.3 billion so far.

8. b

### Attingal Outbreak

- The uprising happened in 1721 in the State of Travancore.
- The East India Company came to Attingal calling for the pepper from Nedumangad, one of the most sought-after spices in Europe.
- EIC got the permission to build a fort called Anjengo in 1694 from the queen.
- They also got exclusive rights to buy pepper at a much cheaper rate than what the Dutch were offering.
- Following the civilian unrest, the queen ordered the British to stop the construction of the fort but they refused. It was the first instance of rivalry between Native ruler and EIC.
- After crushing the native troops, the fort became full settlement of the English.
- William Gyfford was appointed as the new officer of the settlement to rein in corruption as some officers were indulging in private trade.
- By the 1720s, the British dictated the terms of merchandise in Attingal.
- The natives were fed up with the unethical trade practices of the British and mocking of their religious practices by British.

9. d

- The Taliban had recently called on fighters in the Panjshir Valley to lay down their arms.
- The Panjshir Valley is the centre of Afghanistan's most important pocket of **armed anti-Taliban forces**.
- The valley stood strong against the Taliban rule from 1996-2001 before the US-led foreign troops invaded Afghanistan.

### Panjshir Valley

- Located 150 km north of Kabul, Afghanistan, the Valley is near the Hindu Kush mountain range.
- It's divided by the Panjshir River and ringed by the Panjshir Mountains in the north and the Kuhestan mountains in the south.
- The mountain tops are covered by snow throughout the year.
- This difficult terrain makes the Valley a nightmare for invaders.

10. b

### State of the World's Trees

- The report is released by London-based Botanic Gardens Conservation International.

### Report Highlights -

- India is home to 650 endemic tree species that are not found anywhere else.
- **Threatened Species -**
  - The Palearctic and Nearctic (North America) realms mostly have tree species that are not threatened.
  - Indo-Malaya, Oceania, the Afrotropics (Africa south of the Sahara, including Madagascar) has the highest proportion of threatened tree species.
- **Number of Tree Species -**
  - The Neotropics (Central and South America) have the largest number of tree species followed by Indo-Malaya, Afrotropics.
  - The Nearctic and Oceania have the lowest number of tree species.

- Brazil, China, Colombia and Indonesia had a large number of tree species as well as a large number of threatened species.
- Madagascar is one of the countries with the highest number of threatened trees.
- **Major Threats -**
  - Agriculture (29%), logging (27%), livestock farming (14%), Residential and commercial development, fire and fire suppression (13%), energy production and mining (9%), wood and pulp plantations (6%), invasive and other problematic species (5%) and climate change (4%).

11. c

### **Anaimalai Flying Frog**

- It is also known as the False Malabar Gliding Frog.
- It is endemic to the southern part of the Western Ghats.
- This species is usually larger than bush frogs.
- Mating takes place usually between June and October, during the rainy season.
- The female creates foam nests on leaves, into which the eggs are laid and the male fertilises them.
- The outer layer of foam protects the eggs from bacteria, predators and weather changes.
- When the eggs hatch, the nest disintegrates and tadpoles drop into the water body below.

12. b

### **Ashok Kumar Tandon Committee**

- Ministry of Information and Broadcasting has constituted a ten member Committee headed by Shri Ashok Kumar Tandon, renowned Journalist and Member, PrasarBharati.
- The committee was tasked to take a look at the existing guidelines of Journalists Welfare Scheme of the Ministry of Information and Broadcasting.
- The Journalists Welfare Scheme which has been in existence for a many years needs a relook from a futuristic perspective and broad basing the coverage for the benefit of the Journalists of this country.
- With the enactment of Occupational, Safety, Health and Working Condition Code 2020, the definition of the Working Journalists has been broadened to include within its fold those working in both traditional and digital media.
- Further, it was also considered necessary to look at the possible parity between accredited and non-accredited journalists from the perspective of welfare and availing of benefits under the scheme.

13. b

- India will chair the crucial Taliban and Libya sanctions committees and the Counter-Terrorism Committee of the UN Security Council (UNSC) during its tenure as non-permanent member of the powerful 15-nation UN body. (2021-22).

### **1988 Sanctions Committee**

- It was formed through resolution number 1988 in 2011 by splitting the 1267 sanctions regime on al-Qaeda.
- Resolution 1988 dealt with sanctions relating to the Taliban, while Resolution 1989 addressed sanctions on Al-Qaeda.
- Until the passing of both the resolutions, sanctions on the Taliban and Al-Qaeda had been handled by the same committee.
- The committee oversees the sanctions measures imposed by the Security Council on Talibans.
- Individuals and entities are designated on the 1988 Sanctions List as individuals, groups, undertakings and entities associated with the Taliban in constituting a threat to the peace, stability and security of Afghanistan.
- The listed entities and individuals are subject to an assets freeze, travel ban and arms embargo.

14. c

### **Green List of Protected and Conserved Areas (GLPCA)**

- It is a new global quality standard for protected areas being developed by IUCN and partners.
- The intended aims of the IUCN GLPCA are:
  1. To recognize and reward effective management and equitable governance of protected areas
  2. To assist participating countries to achieve quality in the implementation of their national protected area systems, in part towards meeting and reporting on CBD Aichi Target commitments.
- In order to develop the IUCN GLPCA, the IUCN Green List Initiative is under way.
- Through this initiative, IUCN and collaborating partners (which include the CA/TS scheme) will develop the global standards and matching guidance that can be used to assess, evaluate and recognize quality in protected areas.
- Participating countries will be able to apply local context and criteria for the IUCN Green List process, but the benchmark will be a credible set of IUCN Green List global standards.

15. d

#### **Climate Adaptive Planning for Resilience and Sustainability Development in Multi-Hazard Environment (CAP-RES) Programme**

- The Department of Science & Technology, Government of India (GoI), under the National Knowledge Mission on Climate Change (NKMCC), has supported the CAP-RES (Climate Adaptive Planning for Resilience and Sustainability) programme.
- The mission is to be implemented by CECR-ECDRM division of National Institute of Disaster Management (NIDM).
- NIDM works under the Ministry of Home Affairs.
- CAP-RES aims to address the knowledge gap across the specified themes of resilience and sustainability.
- This would enable effective interface of the science policy planning and practices and would facilitate knowledge based roadmap for addressing climate change induced risks and vulnerability.

Thematic Areas of CAP-RES include:

1. Green Growth and Disaster Risk Reduction,
2. Resilient Agriculture,
3. Resilient Health,
4. Climate Proofing Disaster Relief & Recovery, and
5. Environmental Policy Instruments in DRR

16. d

#### **Eastern Economic Forum 2021**

- The Eastern Economic Forum was established by decree of the President of the Russian Federation Vladimir Putin in 2015 to support the economic development of Russia's Far East and to expand international cooperation in the Asia-Pacific region.
- The forum will meet annually in every September since 2015.
- It will take place on 2–4 September in Vladivostok on the Far Eastern Federal University (FEFU) campus.
- The Eastern Economic Forum was established by decree of the President of the Russian Federation Vladimir Putin in 2015 to support the economic development of Russia's Far East and to expand international cooperation in the Asia-Pacific region.

17. b

#### **Mahatma Gandhiji**

- **Porbandar, Gujarat** – Birth Place of Mahatma Gandhi
- **Pietermaritzburg station, South Africa** – It is the place where Gandhi was thrown out from the train compartment.
- The incident changed his life, and he stood up against racial discrimination and made active non-violence as his mission.

- **Yerawda Jail, Pune** – It is the place where historic Poona Act was signed when Gandhiji fasted to protest against Communal award.
- He was housed three times in this jail, including in 1932 and in 1942 along with many other freedom fighters, during Quit India Movement.
- **Aga Khan Palace, Pune** – This is the place where Gandhiji lived for 21 months after he gave the call for Quit India on 8th August, 1942.
- During this period, the Mahatma lost his wife Kasturba and his secretary Narayan Desai.
- The Samadhis of both of them are located in this grand palace of Pune.
- **Rajghat, Delhi** – It is where the Samadhi of Mahatma Gandhi is located.
- **Mhow** - Ambedkar was born in 1891 in the town and military cantonment of Mhow (now officially known as Dr Ambedkar Nagar) in the Central Provinces (now in Madhya Pradesh).
- **Chaitya Bhoomi** – It is a Buddhist chaitya and the cremation place of B. R. Ambedkar, the chief architect of the Indian Constitution.

18. b

- In the presence of Union Home Minister, Shri Amit Shah, a historic KarbiAnglong Agreement to end the decades old crisis ensuring Assam's territorial integrity was signed in New Delhi recently.

#### **Salient Features of Karbi-Anglong Peace Agreement**

- **Peace Accord** – Under this historic agreement, 5 militant organizations laid down arms and more than 1000 of their armed cadres have given up violence and joined the mainstream of society in February 2021.
- **Development Package** – A special development package of Rs. 1000 crore will be allocated over five years by the Central Government and the Assam Government to take up special projects for the development of Karbi areas.
- **Transfer of Autonomy** – This agreement will transfer as much autonomy as possible in exercising their rights to the KarbiAnglong Autonomous Council, without affecting the territorial and administrative integrity of Assam.
- **Protection of culture** – This agreement will ensure the protection of the culture, identity, language, etc. of the Karbi people and all-round development of the region.
- **Rehabilitation of militants** – A provision has also been made in this agreement to rehabilitate the cadres of armed groups.
- **Karbi Welfare Council** – The Government of Assam will set up a Karbi Welfare Council to focus on the development of the Karbi people living outside the KarbiAnglong Autonomous Council area.
- **Funding support** - The Consolidated Fund of the State will be amended to meet the resources of the KarbiAnglong Autonomous Council.

19. b

#### **Breakthrough Infection**

- If a person gets infected with the SARS-CoV-2 virus, 14 days after the second shot of the vaccine, it is called a 'breakthrough infection'.
- The two-week window is the time it takes for the body to produce necessary antibodies following a shot of the vaccine.
- Breakthrough infections are not a surprise.
- In clinical trials, all vaccines available have reported efficacy rates between 70% and 90%.
- This implies that between 10% and 30% of a vaccinated population will be vulnerable to infection.
- **Variant of High Consequence** – It has clear evidence that prevention measures or medical countermeasures (MCMs) have significantly reduced effectiveness relative to previously circulating variants.

20. d

#### **Nipah in Kerala**

*A new case of Nipah has been detected in the Kozhikode district.*

- The natural host of the Nipah virus are fruit bats of the Pteropodidae family and Pteropous genus, widely found in South and South East Asia.
- However, the actual source of the current infection is not yet known.
- It can be transmitted to humans from animals (such as bats or pigs), or contaminated foods and can also be transmitted directly from human-to-human.
- There is no treatment or vaccine available for either people or animals. The primary treatment for humans is supportive care.
- It was first recognized in 1999 during an outbreak among pig farmers in, Malaysia.
- Till date, India has experienced four episodes of NiV outbreaks with CFR ranging from 65% to 100%. The evidence of NiV infection are reported in,
  1. Siliguri district, West Bengal (2001),
  2. Nadia district in West Bengal (2007),
  3. Kozhikode district of Kerala (2018), followed by another outbreak in the same state in 2019.

21. d

### Animal Spirits

- This is a term that refers to the emotions and instincts that guide the behaviour of investors and consumers in a market economy.
- It was coined by British economist John Maynard Keynes in his 1936 book – -The General Theory of Employment, Interest, and Money, to explain the persistence of economic fluctuations under capitalism.
- Animal spirits refer to the ways that human emotion can drive financial decision-making in uncertain environments and volatile times.
- Animal spirits essentially account for market psychology and in particular the role of emotion and herd mentality in investing.
- Animal spirits are used to help explain why people behave irrationally, and are the forerunner to modern behavioral economics.
- Keynes argued that investment and consumption are often based on how people feel about the overall economy rather than on unbiased, rational analysis of facts.
- Critics have argued that while people are not perfectly rational, they are not completely guided by emotions either; hence, animal spirits cannot sufficiently explain economic cycles.

22. c

### Inspiration4

- SpaceX is going to launch 'Inspiration4', the world's 1st all-civilian, non-governmental spaceflight soon.
- This mission will take 4 private citizens into space in the Crew Dragon spacecraft, which will be privately operated by SpaceX.
- This mission involves circling the Earth for 3 days at the height of 575km (low Earth orbit), and then splashing down into the Atlantic Ocean.
- Inspiration4 will orbit the Earth at 575km, higher than the International Space Station (408km) and the Hubble space telescope (547km).
- This will be the farthest distance travelled by a crewed mission since 2009, when astronauts went to repair the Hubble telescope.
- The dome window has been inspired by the Cupola, a module on the International Space Station used to make observations about our planet.
- **Significance** - The journey will present an opportunity for collecting many health data that will aid in planning future crewed space missions.
- This will help in assessing behavioural and cognitive changes over the journey.
- The travellers will undergo balance and prescription tests just before and after their journey to assess their response to the change in gravity.



23. d

**Asset Monetisation programme**

- The Union government has announced its plans to –monetize about Rs 6 trillion worth of assets held by it, and public sector units (PSUs), under the National Monetisation Pipeline (NMP).
- The Prime Minister's Office is directly monitoring the progress of the asset monetisation programme.

24. d

**Deep Sea Mining**

- It is the process of retrieving mineral deposits from the deep sea – the area of the ocean below 200 m.
- Parts of the ocean floor are rich in minerals, including polymetallic nodules composed mostly of copper, manganese, cobalt and nickel.
- These are found on seabeds 4 to 6 km below the surface.
- International Sea Bed Authority is an intergovernmental body established by the Law of the Sea Convention to organize, regulate and control all mineral-related activities in the international seabed area beyond the limits of national jurisdiction.

25. b

**Gita Govinda**

- It is a work composed by the 12th-century Hindu poet, Jayadeva.
- It describes the relationship between Krishna and Radhika.
- The Gita Govinda consists of twelve chapters, further divided into twenty-four songs.
- Each song consists of eight couplets, it is called Ashtapadi.
- Jayadeva was a contemporary of several other poets in the court of Lakshmana Sena of Bengal.

26. a

**Blood Honey**

- Sunderbans being the home to the Royal Bengal tigers, every year people die venturing into the forests to collect this honey.
- Due to the risks involved in its collection, it is called blood honey.
- It is also called Sundarban honey, as it is collected by the Sunderbans' Moulis community.
- This comparatively less thick honey has high demand for its nutritional value and purity.
- As this honey is multi-floral and there is practically no use of antibiotics or pesticides in Sundarbans.
- It is nearly twice as expensive as the branded honey.
- **Reasons for the high cost** - One major part of the cost input is going deep into the forest area. This means that there are also no pesticides or chemicals or any other impurities in this honey.
- Additionally, the purpose of ventures like this is the financial upkeep of this community too.

27. c

**Basmati Rice**

- It is cultivated in the states of Himachal Pradesh, Punjab, Haryana, Delhi, Uttarakhand, Madhya Pradesh, Jammu and Kashmir and western Uttar Pradesh.
- In the domestic level, GI tag for Basmati Rice grown in Indo-gangetic plain is granted to Agricultural and Processed Foods Export Development Authority, a wing in the Ministry of Commerce and Industry.
- The stakeholders from the Madhya Pradesh region have submitted documents for inclusion in the basmati grown areas.
- On the global level, India and Pakistan are fighting for the GI tag for Basmati Rice in the European Union (EU).



- International laws require that before applying for registration of any product in the international market it has to be protected under the geographical indication laws of that country.
- Pakistan under its national law, has also granted GI tag for it.

28. c

### **Hycean Worlds**

- The word –Hycean| represents the combination of Hydrogen and Ocean.
- They are new class of exoplanets with densities between those of rocky super-Earths and larger mini-Neptunes
- They are composed of water-rich interiors with massive oceans underlying hydrogen-rich atmospheres.
- These planets can be up to 2.6 times larger than Earth and have atmospheric temperatures up to nearly 200 degrees Celsius.
- Their oceanic conditions could be similar to those conducive for microbial life in Earth's oceans.
- However, size alone is not enough to confirm whether a planet is Hycean. Other aspects such as mass, temperature and atmospheric properties are required for confirmation.

29. b

### **Minimum Support Price**

- Kharif Crops covered under the MSP – Paddy, Jowar, Bajra, Maize, Ragi, Arhar (Tur), Moong, Urad, Cotton, Groundnut in shell, Sunflower seed, Soyabean, Sesamum, Nigerseed
- Rabi Crops covered under the MSP – Wheat, Barley, Gram, Masur (Lentil), Rapeseed & Mustard, Safflower, Toria
- Other Crops – Copra, De-husked coconut, Raw Jute
- Fair and Renumorative Price (FRP) for Sugarcane

30. a

- A carbon dating analysis of rice with soil, found in a burial urn at Sivakalai in Thoothukudi district of Tamil Nadu, by the Miami-based Beta Analytic Testing Laboratory has yielded the date of 1155 BC, indicating that the Thamirabarani River (or) Porunai Civilisation dates back to 3,200 years.
- Archaeological excavations are being done at Kodumanal, Keeladi, Korkai, Mayiladumparai, Sivakalai, Adichchanallur and GangaikondaCholapuram in Tamil Nadu.

### **Porunai River**

- The only major perennial river in Tamil Nadu, Thamirabarani has been mentioned as Porunai, Than Porunai, Porunal and Poruntham in Tamil literature — right from the Sangam era to Nayakar era (6th century BCE to 17th century CE).

31. a

- The World Bank has recently released the second part of Groundswell report: Acting on Internal Climate Migration.

### **The Groundswell Report Series: Bridging the Gap**

#### **First Groundswell Report, 2018**

- It helps to understand the scale, trajectory, and spatial patterns of future climate migration within countries, with a focus on three regions: Sub-Saharan Africa, South Asia, and Latin America.
- Specifically, it examined how slow-onset climate change impacts on water availability and crop productivity, and sea-level rise augmented by storm surge, could affect future internal migration.

#### **Second Groundswell Report, 2021 (Acting on Internal Climate Migration)**

- It builds on the work of 1st report, applying the same approach to three new regions: the Middle East and North Africa, East Asia and the Pacific, and Eastern Europe and Central Asia.
- Qualitative analyses of climate-related mobility in countries of the Mashreq and in Small Island Developing States (SIDS) are also provided.

### **Highlights of the report**

- According to the report, climate change can force some 216 million people in six world regions to move within their own countries by 2050.
- Hotspots of internal climate migration can emerge as early as 2030 and continue to spread and intensify by 2050.
- It also found that immediate and concerted action to reduce global emissions and support green, inclusive and resilient development, could reduce the scale of climate migration by as much as 80 per cent.

32. c

### **Software as a Service (SaaS)**

#### **Background**

- Earlier, companies would have to install software in their clients' localised hardware for them to use their applications.
- So, this required customers to pay for use of the software upfront, and also for the hardware on which the software would run.
- Companies also had to invest in manpower/IT teams at their end to ensure successful implementation of the software and its continuous maintenance.

#### **Software as a Service (SaaS)**

- It is a way of delivering software applications over the internet when a customer requires them.
- In this system, software itself is considered as a service industry.
- SaaS is one of three main categories of cloud computing, alongside infrastructure as a service (IaaS) and platform as a service (PaaS).
- SaaS applications are sometimes called Web-based software, on-demand software, or hosted software.
- **Advantages** - The biggest advantage is, it enables innovation.
- It has basically converted fixed costs of companies into variable costs.
- When capital is scarce, the SaaS model frees up capital for more high priority requirements.

33. b

- With Rocky Mountain Institute (RMI) and RMI India's support, NITI Aayog has launched Shoonya Campaign.

#### **Shoonya Campaign**

The Shoonya campaign aims to:

1. Accelerate adoption of electric vehicles (EVs) in the urban deliveries segment and
  2. Create consumer awareness about the health, environmental and economic benefits of zero-pollution delivery.
- Urban freight vehicles account for 10% of freight transportation-related CO<sub>2</sub> emissions in India, and these emissions may grow by 114% percent by 2030.
  - As part of the campaign, a corporate branding & certification programme is being launched to promote industry's efforts towards transitioning to EVs for final-mile deliveries.
  - An online tracking platform will share the campaign's impact through data such as vehicle kilometers electrified, carbon savings, criteria pollutant savings and other benefits from clean delivery vehicles.

34. c

#### **Grindadrap**

- It is a traditional annual killing of whales and dolphins.
- It has been going on for over four hundred years on the small North Atlantic island – Faroe Island that belong to Denmark.
- The animals are driven into shallow waters where they are then cut with knives.
- The killing is regulated by local laws.
- The meat and blubber from the animals is shared out among the community.

- Neither the pilot whales nor the white-sided dolphins are endangered.
- The hunt usually focuses on the whales rather than the dolphins.

35. a

### **Toxic 3 Os**

- Oxybenzone, Octinoxate and Octocrylene are known as Toxic 3 Os , which active ingredients present in more than two-thirds of all sunscreens.
- They pose a threat to public health, marine life and coral reefs, according to latest research.
- Octocrylene in sun protection products degrades into benzophenone, a carcinogen that can also interfere with key hormones and reproductive organs.
- They cause human cell damage that has been linked to cancer, disrupt hormones, have been found in breast milk, blood and urine and are known allergens.
- Oxybenzone is particularly toxic to corals at concentrations as low as a few parts per trillion, the equivalent of three drops in an Olympic-size swimming pool may be enough to severely damage or kill coral.

36. a

### **R Corona Borealis**

- R Corona Borealis is a low-mass yellow supergiant star in the constellation of Corona Borealis.
- **Corona Borealis** is a small constellation in the Northern Celestial Hemisphere.
- R Coronae Borealis stars (RCB), have very little hydrogen and are often referred as Hydrogen-deficient star.
- It is about 90% helium and less than 1% hydrogen.
- The majority of the remainder is carbon.
- This is in stark contrast to the majority of stars whose atmospheres are dominated by hydrogen.

37. b

- The United States, United Kingdom and Australia has recently announced a new defence deal, under which America and Britain will help Australia deploy nuclear-powered submarines in the Pacific region.

### **AUKUS Agreement**

- It is a new enhanced trilateral security partnership between United States, United Kingdom and Australia.
- It aims to create a partnership where technology, scientists, industry, defence forces are all working together to deliver a safer and more secure region that ultimately benefits all.
- The first major initiative of AUKUS would be to deliver a nuclear-powered submarine fleet for Australia.
- Australia will be only the second country after Britain in 1958 to be given access to US nuclear technology to build nuclear-powered submarines.
- The nuclear-powered submarines will give Australia naval heft in the Pacific, where China has been particularly aggressive.
- Although the leaders of these three countries did not say so, the deal is seen as a step towards curtailing China, which has made significant aggressive manoeuvres in the Pacific region, especially in and around the South China Sea, where it has expansive territorial claims.

### **The AUCKUS & France**

- The deal has complicated the relations between France and Australia, and also France and the US.
- Back in 2016, Australia had signed a contract to buy 12 Attack-class submarines from the French shipbuilder Naval Group.
- With this new agreement, France-Australia submarine deal seems to be collapsed and a harsh legal battle over the contract appears inevitable.
- France is upset as it has been kept out of the loop and also called the partnership, -a stab in the back.

38. a

### **Background**

- Conventionally, building envelopes consist of masonry walls built with burnt clay bricks, concrete blocks, hollow clay blocks, fly ash bricks, lightweight blocks, and so on.
- The envelopes spend energy during their production, thus incurring carbon emission (i.e., possess embodied carbon) consume mined raw material resources which lead to unsustainable constructions.
- The masonry units are manufactured either through the process of firing or using high-energy/embodied carbon binders such as Portland cement.
- As a result, the annual consumption of bricks and blocks in India is about 900 million tonnes.
- Besides, the construction industry generates vast amounts (70 – 100 million tonnes per annum) of construction and demolition waste (CDW).

### **Low-C bricks**

- The team of researchers from Indian Institute of Science (IISc), Bangalore developed low embodied carbon bricks from construction and demolition (C&D) waste through an alkali activation process using fly ash and ground slag and characterising the thermal, structural, and durability characteristics of Low-C bricks and their masonry.
- It does not require high-temperature firing, and avoid the use of high-energy materials such as Portland cement.
- The technology will also solve the disposal problems associated with C&D waste mitigation.

39. b

- India has recently developed an indigenous technology to convert high ash Indian coal to methanol and established its first pilot plant in Hyderabad.
- This technology will help the country move towards the adoption of clean technology and promote the use of methanol as a transportation fuel (blending with petrol), thus reducing crude oil imports.

### **Indian Coal**

- Coal is the most important and abundant fossil fuel in India.
- It accounts for 55% of the country's energy need.
- The country's industrial heritage was built upon indigenous coal.
- In India coal is broadly classified into two types
  1. Coking coal
  2. Non-coking coal
- The Coking coal constitutes only a small part of the total coal resources of the country.
- As per Geological Survey of India, the reserve of coking coal (prime, medium and semi-coking) was 35,004 MT and non-coking coal was 3,09,017 MT.
- Hard coal deposit spread over 27 major coalfields, are mainly confined to eastern and south central parts of the the country.
- The lignite reserves stand at a level around 36 billion tonnes, of which 90 % occur in the southern State of Tamil Nadu.

40. c

### **Gupta Architecture**

- The Archaeological Survey of India (ASI) has recently discovered the remains of an ancient temple dating back to the Gupta period (5th century) in a village in Uttar Pradesh's Etah district.
- The stairs of the temple had 'shankhalipi' inscriptions, which were deciphered by the archaeologists assaying, 'Sri Mahendraditya', the title of Kumaragupta I of the Gupta dynasty.
- As per the ASI, the stairs led to a structural temple built during the Gupta period.
- The discovery becomes significant since only two other structural temples from the Gupta age have been found so far — Dashavatara Temple (Deogarh) and Bhitargaon Temple (Kanpur Dehat).
- In the 5th century, Kumaragupta I ruled for 40 years over north-central India.

- The Guptas were the first to build structural temples, distinctly different from the ancient rock-cut temples.

41. d

### **Shankhalipi Script**

- Shankhalipi or 'shell-script' is a term used to describe ornate spiral characters assumed to be Brahmi derivatives that look like conch shells or shankhas.
- They are found on temple pillars, columns and rock surfaces across north-central India and they date to between the 4th and 8th centuries.
- Both Shankhalipi and Brahmi are stylised scripts used primarily for names and signatures.
- The inscriptions consist of a small number of characters, suggesting that the shell inscriptions are names or auspicious symbols or a combination of the two.

42. a

43. c

### **R Value**

- The R value, which reflects how rapidly the COVID-19 pandemic is spreading, dropped to 0.92 by mid-September after going over one in August-end.

### **R-value**

- R-value or R-factor or  $R_0$  (R-naught) or Reproduction Rate refers to how many persons an infected person infects on an average.
- It indicates the speed at which the Covid infection is spreading in the country, along with the 'efficiency' of the spread.
- Higher the R-value number, the more contagious is the disease caused by the virus and the faster it will spread in the community.

44. a

### **Trojan Asteroids**

- The Trojan asteroids are leftovers of the primordial material from which Jupiter and the other outer planets were formed.
- The space rocks function similar to time capsules from the earliest days of the solar system, about 4.5 billion years ago.
- The Trojans orbit the Sun in two loose groups, with one group leading ahead of Jupiter in its path, the other trailing behind.
- These primitive bodies hold vital clues to deciphering the history of the solar system.

### **LUCY Mission**

- NASA's Lucy Mission will be the first space mission to study the Trojans.
- The mission takes its name from the fossilized human ancestor (called 'Lucy' by her discoverers) whose skeleton provided unique insight into humanity's evolution.
- Likewise, the Lucy mission will revolutionize our knowledge of planetary origins and the formation of the solar system.

45. a

### **Vishnuonyx**

- Recently, the fossil of Vishnuonyx neptuni (Neptune's Vishnu) species was found in the Hammerschmiede area, a fossil site in Bavaria, Germany.
- Between 12.5 and 14 million years ago, the members of the Vishnuonyx genus of otters lived in the major rivers of southern Asia.
- Fossils of these now extinct otters were first discovered in sediments found in the foothills of the Himalayas.
- This is the first discovery of any member of the Vishnuonyx genus in Europe; it is also its most northern and western record till date.

- **Vishnuonyx** were mid-sized predators that weighed 10-15 kg.
- They depended on water and could not travel long distances over land.
- Its travels over 6,000 km to Europe were probably made possible by the geography of 12 million years ago, when the Alps were recently formed.
- These Alps and the Iranian Elbrus Mountains were separated by an ocean basin, which would have made it easier for the otters to cross it.

46. b

#### **DRINK Malware**

- India's Computer Emergency Response Team (CERT-In) has issued an advisory to bank customers of an android malware called, Drink, that steals information and money.
- This new banking malware has evolved from a primitive SMS stealer in 2016 to a banking trojan that persuades users to enter sensitive banking information.
- The attack campaign can effectively jeopardise security of sensitive customer data and lead to large scale attacks and financial fraud.

47. b

48. b

49. b

- Everything we see, the planets, moons, massive galaxies, makes up less than 5% of the universe.
- About 27% is dark matter and 68% is dark energy.

#### **Dark energy Vs Dark matter**

- While dark matter attracts and holds galaxies together, dark energy repels and causes the expansion of our universe.
- Despite both components being invisible, we know a lot more about dark matter, since its existence was suggested as early as the 1920s, while dark energy wasn't discovered until 1998.
- Large-scale experiments like XENON1T have been designed to directly detect dark matter, by searching for signs of dark matter 'hitting' ordinary matter, but dark energy is even more elusive.

50. d

#### **Green Voyage 2050 Project**

- The Green Voyage 2050 Project is a partnership project between the Government of Norway and IMO launched in 2019 aiming to transform the shipping industry towards a lower carbon future.
- It supports developing countries, including Small Islands Developing States (SIDS) and Least Developed Countries (LDCs), in meeting their commitment towards relevant climate change and energy efficiency goals, for international shipping, through supporting the Initial IMO GHG Strategy.
- The International Maritime Organization is executing the GreenVoyage2050 Project through the Project Coordination Unit (PCU).
- The Norwegian Ministry of Climate and Environment provides the funding for the GreenVoyage2050 Project.

#### **Partnering Countries**

- The GreenVoyage2050 Project is working with 12 countries: Azerbaijan, Belize, China, Cook Islands, Ecuador, Georgia, India, Kenya, Malaysia, Solomon Islands, South Africa, Sri Lanka.
- The participating countries can be broadly categorized into –New Pilot Countries and –Pioneer Pilot Countries.
- **New Pilot Countries (NPCs)** are those which will, as a first step, undertake the development of a national maritime emissions assessment, establishing a baseline and build the information base, laying the foundation for targeted actions to reduce emissions from shipping.
- **Pioneer Pilot Countries (PPCs)** are those which have already undertaken maritime emissions baseline work and have initiated development of their National Action Plan (NAP) to address GHG emissions from ships.

**Background**

GreenVoyage2050 builds upon two IMO projects that may be regarded as baseline projects in this area

1. GEF-UNDP-IMO GloMEEP Project (Global Maritime Energy Efficiency Partnerships)
2. EU-IMO GMN Project (Capacity Building for Climate Mitigation in the Maritime Shipping Industry)

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